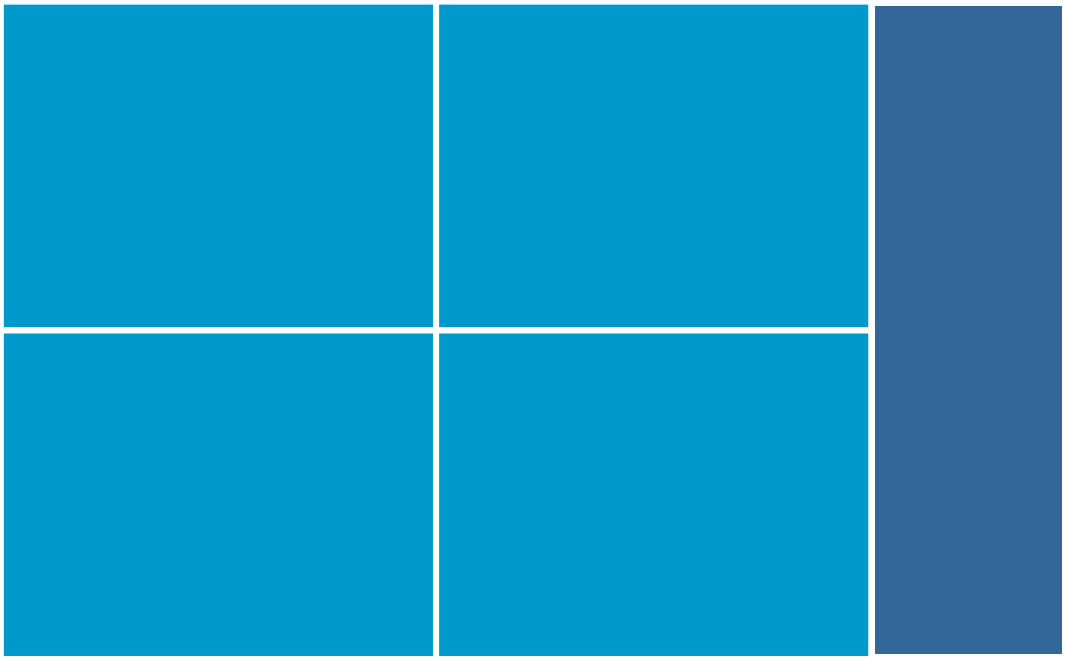
Appendix U
Ashbourne Transport Study, 2009

Derbyshire County Council

Ashbourne Traffic Study

Final
January 2009



Revision Schedule

Final
January 2009

Rev	Date	Details	Prepared by	Reviewed by	Approved by
01	July 08	Draft	**Daniel Godfrey** Senior Assistant Transport Planner	**Bill Gallear** Technical Director	**Bill Gallear** Technical Director
02	Oct 08	Final Draft		**Daniel Godfrey** Transport Planner	**Bill Gallear** Technical Director
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1 Introduction

1.1 Overview

1.1.1 Scott Wilson Ltd. has been commissioned by Derbyshire County Council (DCC) to prepare a study examining traffic issues within the town of Ashbourne, Derbyshire. The work in this report follows a detailed scoping study agreed with DCC in January 2008.

1.1.2 In particular, this report assesses issues of traffic circulation to determine if the current system represents the optimum for the network, as a whole, or if improvements could be made.

1.1.3 Also, pedestrian and public transport accessibility, road safety and parking issues on specific streets have been considered following their identification as issues within the scoping study.

1.2 Study Area

1.2.1 Figure 1.1 identifies the Study Area as given within the Scoping Study. As can be seen from this figure, the focus of the work considers traffic circulation within the central retail core of Ashbourne.

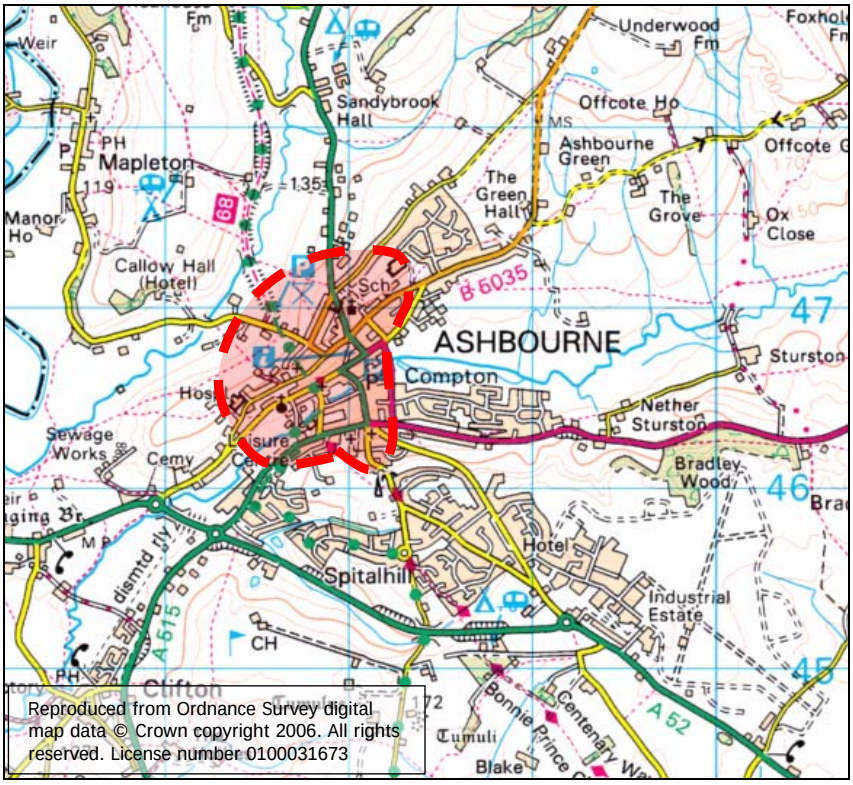


Figure 1.1: Study Area

1.2.2 It is known that there is a historic proposal to provide a bypass of the A515 to join the existing Ashbourne southern bypass. The assessment of this scheme is beyond the scope of this study, which would require the development of a detailed highway network model of Ashbourne and its surrounding area.

1.3 Issues Identified in the Scoping Study

1.3.1 Within the scoping study, five issues were identified as being important with respect to traffic in Ashbourne;

Poor Junction Interaction and Congestion

1.3.2 The key issue identified was the operation of the **Park Road / Belper Road** and **Derby Road / Sturston Road / Compton Street** signalised junctions. At times during the AM peak, It was noted that the storage space between the junctions was exceeded, such that right-turning traffic from Park Road could not fully utilise its green time which resulted in queue propagation along Park Road. This effect was exacerbated if a large vehicle was waiting to turn right into Compton Street, which would block the Sturston Road exit.

1.3.3 Resulting queuing on Park Road reached into Cokayne Avenue, causing the exit from St. John's Street to become blocked by traffic waiting to turn right into Park Road.

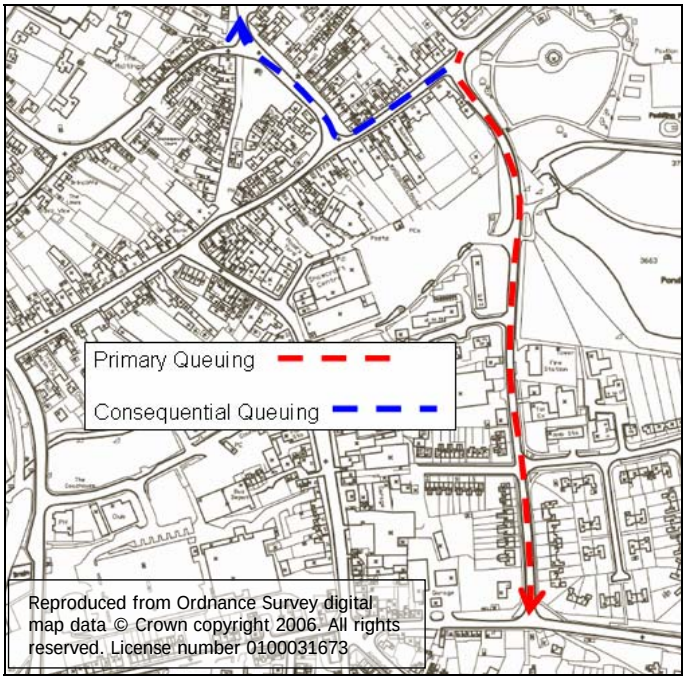


Figure 1.2: Main queuing locations within Ashbourne town centre

Parking Behaviour

1.3.4 It was noted that the on-street parking provision on Cokayne Avenue and The Green Road filled more quickly than surrounding car parks. Parking behaviour on the latter road, especially, created conflicts principally at school closing times.

HGVS

1.3.5 As could be expected from the highway network described in Section 2, HGVs adopt routes through Ashbourne town centre both to service retail opportunities within the town and on their journeys through the town. Members of the public have written to Derbyshire County Council in order to object to the;

- number of HGVs routeing through the town,
- perceived proximity of HGVs to pedestrians, given narrowness of Ashbourne pavements.
- use of Windmill Lane (an unclassified road) by HGVs,
- HGVs mounting the pavement on the descent into Ashbourne from Buxton Road, north of the junction with The Green Road,
- Collisions between HGVs and the Green Man sign on St. John's Street.

Road Safety

1.3.6 From Personal Injury Accident (PIA) statistics supplied by Derbyshire County Council, three clusters of road accidents were identified;

- At the junction of Compton Street and Sturston Street (involving vehicle collisions)
- Along Park Road and Shawcroft (involving vulnerable users)
- Along Compton Street and Dig Street (Involving vulnerable users)

1.3.7 26 accidents (over the five years for which data was available) involved vulnerable road users – 18 pedestrians and 8 cyclists. 3 locations involving such accidents have been discussed above and the only other location with more than one accident was the junction of Dig Street and Shawcroft.

Public Transport

1.3.8 According to Derbyshire County Council's Public Transport Unit, delays to bus services are currently experienced by services entering Ashbourne from the A515 (Buxton Road) and Cokayne Avenue; due to queues from the Park Road / Belper Road signals.

1.4 Methodology

Identification of a Trip Matrix

1.4.1 The scoping study identified that, in order to properly investigate issues of traffic circulation within Ashbourne, it was necessary to gain a greater understanding of the pattern of trips within Ashbourne town centre. In particular, such understanding is necessary to determine how traffic would re-route through the town should interventions recommend changes to traffic management (i.e. one-way systems or turning bans) within the town centre.

1.4.2 Given the above, a trip matrix has been developed for Ashbourne town centre, using a manual estimation process, that has sought to identify;

- internal to external trips,
- external to internal trips,
- external to external trips,
- internal to Internal trips.

1.4.3 The following surveys have been used to establish this trip matrix;

- Automatic Traffic Counts (ATCs) over a 14 day period on A515 (Buxton Road), B5305, A617 (Belper Road), Derby Road, A515 (Station Road) and Mayfield Road,
- 12-hour Manual Classified Counts (MCCs) of the Belper Road / Park Road and Sturston Road / Compton Street signalled junctions, and the Station Street / Church Street junction; which were conducted within the same week as the ATC surveys. These surveys also included queue length observations,
- Beat surveys of Ashbourne town centre car carks, to establish accumulation within each car park during the day.

1.4.4 Furthermore, data from a Road Side Interview (RSI) undertaken in 2004, that identified the destinations of movements from the A515 (Buxton Road), has been used. Due to lack of destinational data on other arms, this information has also been used to infer destinations on the A515 (Station Road) and Derby Road as they enter Ashbourne.

1.4.5 The origins of trips to and from the town centre car parks have been estimated using 2001 Census *Journey to Work* data (that identifies the working catchments of Ashbourne employment and residential centres).

1.4.6 Figure 1.3 summarises the trip matrix identification process.

1.4.7 Traffic recorded to be queuing within Ashbourne at the end of the peak hours (discussed later in this report) have been added to turning flows, in proportion to recorded movement, to ensure that unsatisfied demand flow is considered within the analysis.

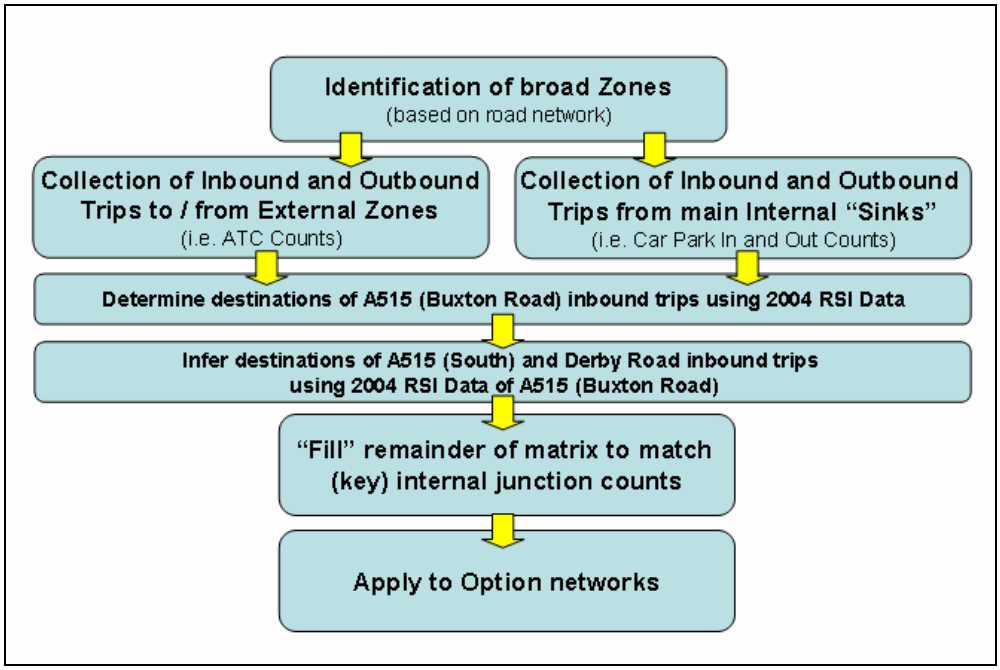


Figure 1.3: Methodology to identify Ashbourne town centre trip matrix

1.4.8 It should be noted that the methodology does not consider the potential for reassignment of traffic outside of the study area (i.e. the total number of trips within the network are fixed). There may be potential for reassignment of traffic into the town centre, due to reduced queuing for example, which may erode option benefits.

Calculation of 'New Development' Flow

1.4.9 Traffic associated with the developments identified in Section 5 has been estimated using TRICS 2007b) and distributed across the network using Census *Journey to Work* data. For many of these developments, detail was limited and some broad assumptions (regarding level of development and traffic flow) have had to be made. However, detail for the specific development of the Nestle site has been taken from the Transport Assessment used to support the planning application of this development.

Improvement to Parking Arrangements

1.4.10 Parking arrangements on The Green Road and Mayfield Road have been examined to determine measures that could be taken to reduce the impact of obstructive parking associated with the School Run.

Road Safety

1.4.11 A review of the Sturston Road / Compton Street signalled junction has been undertaken in order to determine if measures could be introduced to reduce PIAs at this location.

1.4.12 A basic pedestrian audit of the Dig Street / Compton Street corridor has also been undertaken to determine the scope of any potential improvements.

2 Base Conditions

2.1 Overview

2.1.1 Ashbourne is located to the immediate south of the Peak District National Park, and to the north-west of Derby. The town is located approximately equidistant between the M1 and M6 motorways, with the A515 running north-south through the town and into the Peak District itself.

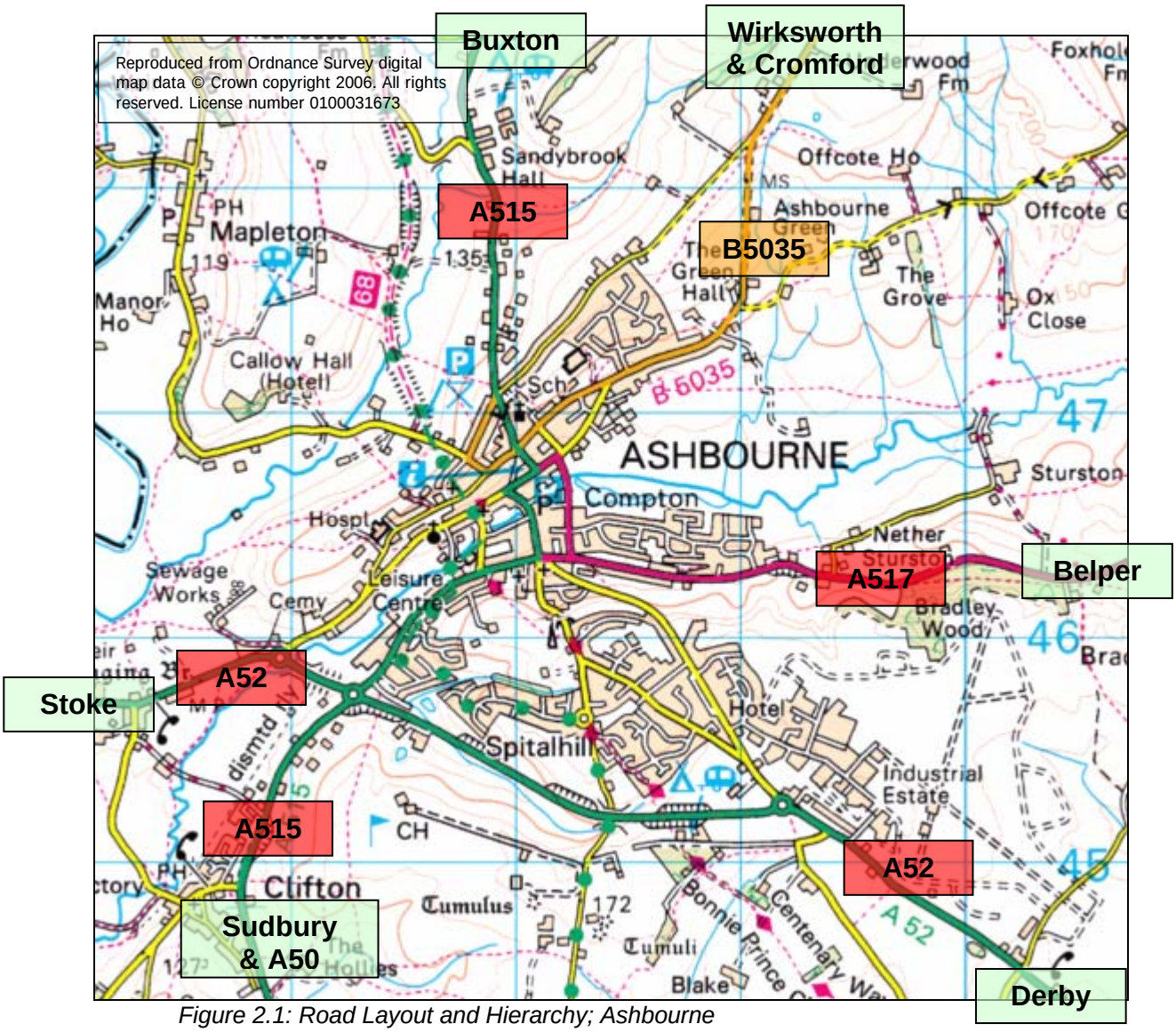


Figure 2.1: Road Layout and Hierarchy; Ashbourne

2.1.2 As can be seen from Figure 2.1, there exist 4 main routes, passing through or around Ashbourne town centre which include the **A515**, the **A52**, the **A517** and the **B5035**.

2.1.3 The **A515** runs north-south through the town; forming the main route between Greater Birmingham area and the Peak District.

2.1.4 The **A52** runs south-east to north-west through the study area, with Ashbourne Town Centre itself bypassed to the south. The A52 forms a major corridor between Derby City and the north-west. The bypassing of Ashbourne to the South also means that traffic entering the town from the south has the choice of either using the new A52 (Bypass) before looping into Ashbourne using Station Street, or using the old A52 (Derby Road).

2.1.5 The **A517** provides a link to the east to Belper.

2.1.6 From the north-east, the **B5035** links Ashbourne to the local centres of Matlock and Chesterfield.

2.1.7 All of the above routes are single carriageway roads, though the A52 and A515 are higher grade routes than either the A517 or B5035.

2.2 Traffic Management

2.2.1 Within Ashbourne itself, the **road layout** has formed around a central grid which delineates the retail and commercial heart of the town. Traffic in Ashbourne, however, does not circulate freely. There has been an issue of congestion on routeings through and around the town centre. These are summarised in Figure 2.2, overleaf.

2.2.2 As can be seen from this figure, traffic currently negotiates the town centre via a limited-length **one-way system**. These include locations on St John's Street, Compton Street and Dig Street.

2.2.3 As such, flow from the A515 and B5035 is obliged to route via Park Road and Surston Road, and traffic must give-way to traffic entering the town from the B5035.

2.2.4 Flow is controlled at three main signalised junctions which include Park Road / Belper Road / Sturston Road, Compton Street / Station Street / Derby Road / Sturston Road and Dig Street / Church Street / St. John's Street.

2.2.5 Most of Ashbourne's shops are located off or around St. John's Street and the A515 (Buxton Road). From the above, it can be seen that the current strategy within Ashbourne is to route as little traffic as possible through this area; pushing circulating flow onto the Station Street – Sturston Road – Park Road corridor.

2.2.6 Ashbourne's **car parks** are located at various locations around the town centre. These are shown in Figure 2.3, overleaf. The larger car parks are associated with local super markets (Sainsburys and Somerfield). Importantly, the Market Square car park (47 spaces) is not used on Market Days (Thursdays and Saturdays) as this where the market is located. However, when this car park is in use it is popular – and, when it is full, cars were noted to circulate around the car parking area and local streets thereby causing localised congestion.

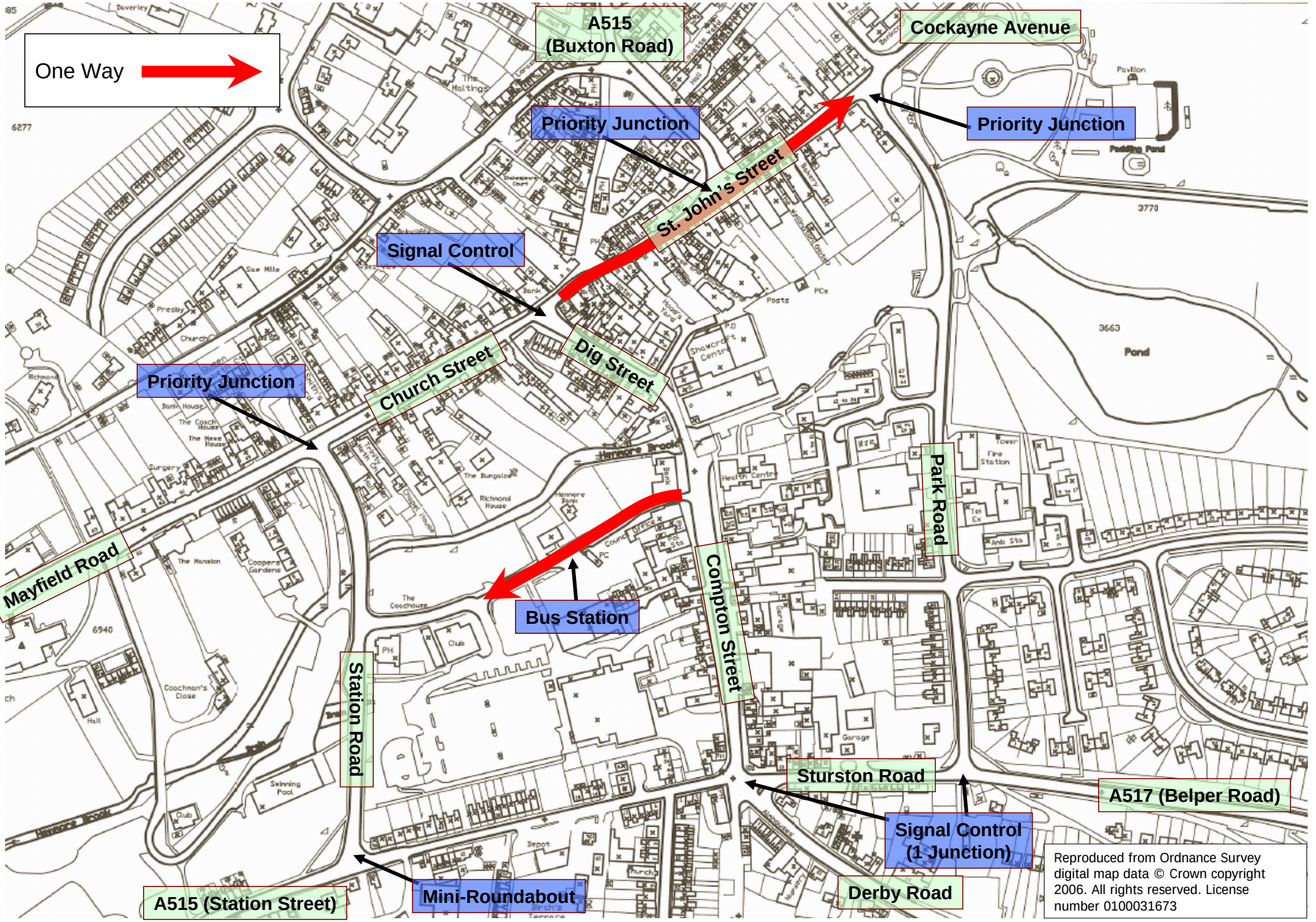


Figure 2.2: Ashbourne Town Centre: Traffic Management and Control

Figure 2.3: Ashbourne Town Centre: Car Parks

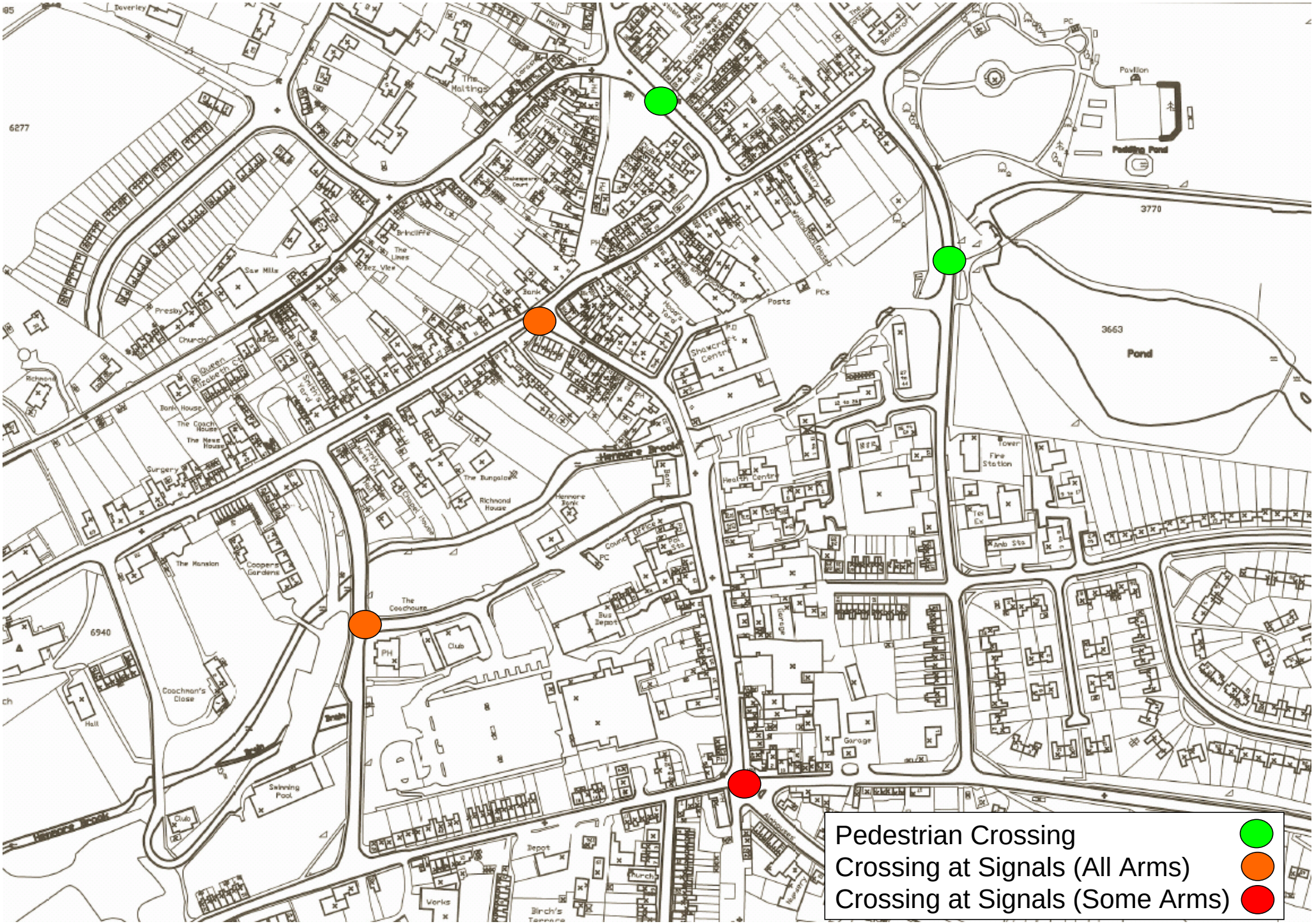


Figure 2.4: Ashbourne Town Centre: Pedestrian Crossing Locations

2.2.7 Formal, signalised **pedestrian crossing facilities** are provided for on Station Road (at the access to Sainsbury's), on Park Road, at the junction of Dig Street and St. John's Street, on the A515 (Buxton Road) and basic provision is made at the Sturston Road / Derby Road signalled junction. This is summarised in Figure 2.4, overleaf.

2.2.8 As can be seen from this figure, no provision is made at the Park Road / Belper Road signalled junctions; or at the St. John's Street / Park Road / Cokayne Avenue and Station Road / Church Street junctions.

2.3 Traffic Flow

Weekday and Weekend Traffic Flow – 2008

2.3.1 The ATCs conducted between the 24th March and 6th April 2008, on the radial routes into Ashbourne.

2.3.2 Figure 2.2 and 2.3 shows the pattern of inbound movement on the radial routes over an average weekday and on a Saturday. These clearly show the AM and PM peak hours (during a weekday) and a single Saturday peak hour of between 1000 and 1100hrs.

2.3.3 These figures also show that the PM peak hour is busier than the AM peak hour, and that this peak hour is busier than the Saturday peak hour (1000 – 1100hrs).

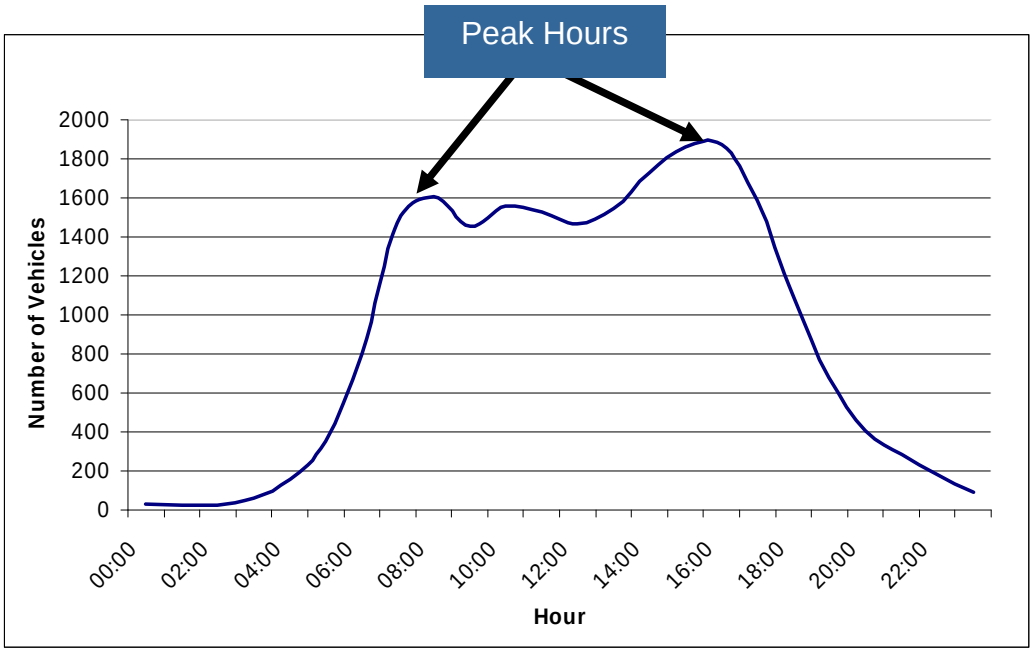


Figure 2.2: Weekday average inbound flow into Ashbourne

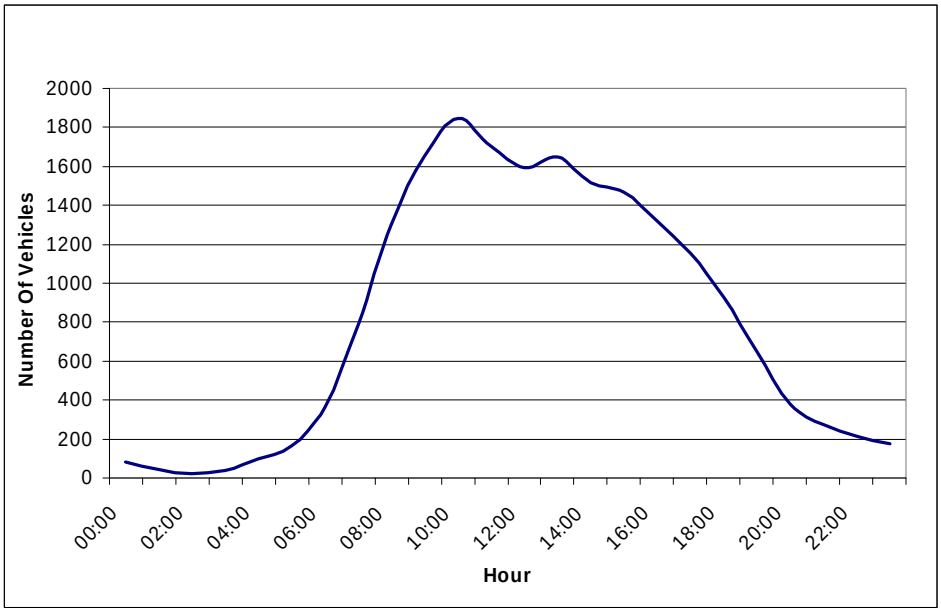


Figure 2.3: Saturday average inbound flow into Ashbourne

2.3.4 Two way traffic flow diagrams are given in Appendix A.

Patterns of Queuing

2.3.5 Queue lengths were observed on the approaches to the following junctions, as part of the manual classified turning counts conducted at the following 3 junctions on the 27th of March 2008:

- Sturston Road / Park Road/ Belper Road;
- Station Street / Compton Street / Sturston Road / Derby Road / Old Derby Road;
- Church Street / Station Road.

2.3.6 Figures 2.4 and 2.5 illustrate the change in average total queue length at each of the above junctions during AM and PM peak hours.

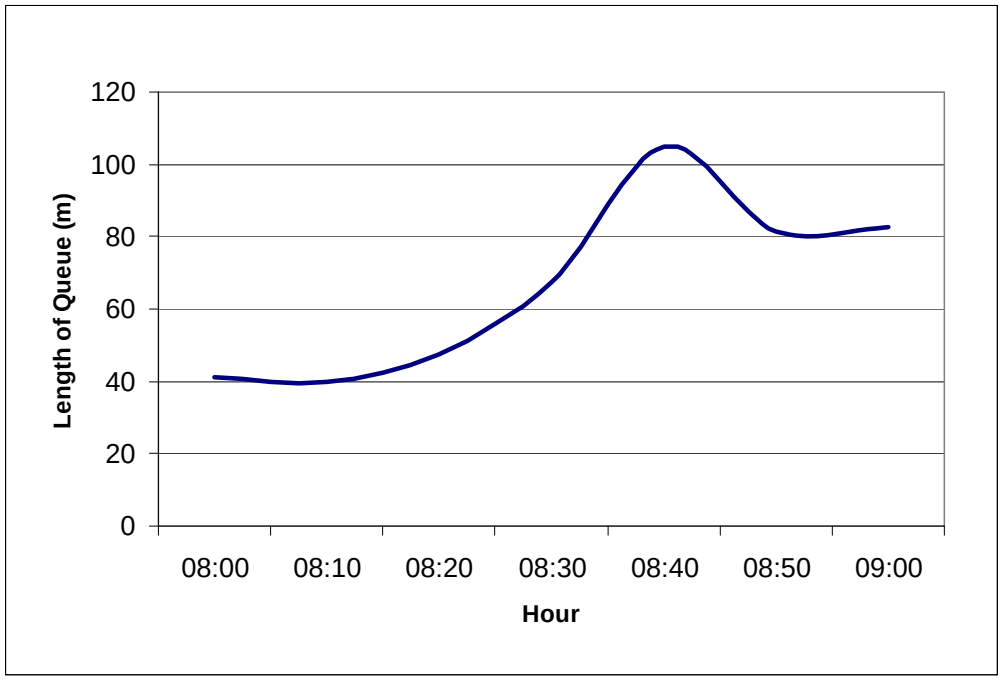


Figure 2.4: Change in Queue Length during AM Peak Hour

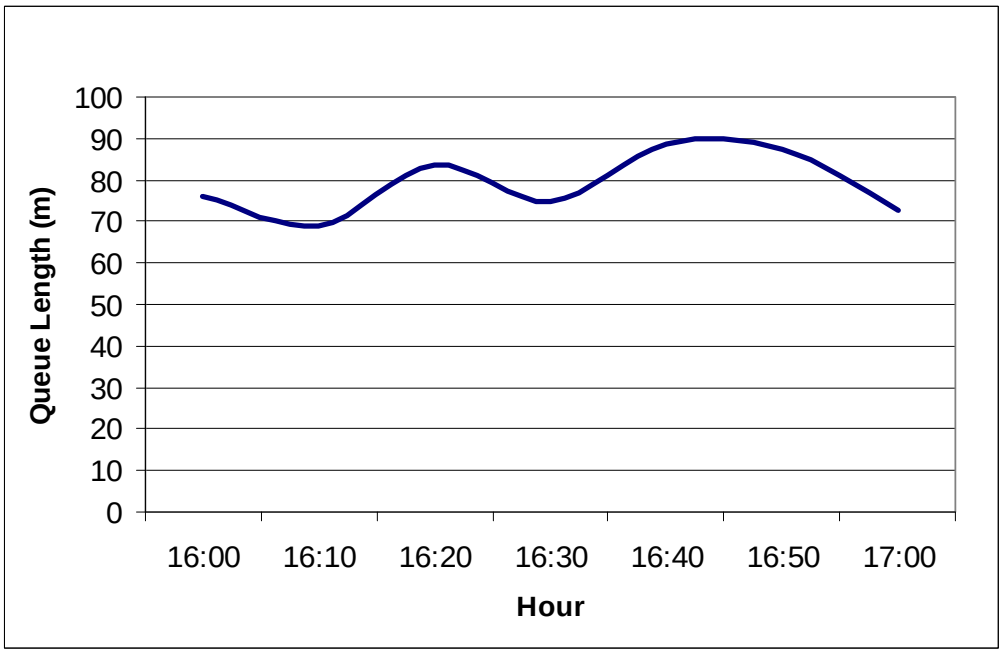


Figure 2.5: Change in Queue Length during PM Peak Hour

2.3.7 The above figures show a progressive increase in queuing during the AM peak hour, compared with a more even queue pattern in the PM peak. This indicates that, although less busy in

terms of total flow during the hour, the AM peak is "peaked" - such that much of its traffic arrives during a shorter period of time within the hour, whereas flow during the PM peak is more consistently busy. Such queue patterns are important with respect to the modelling techniques used in this assessment, which are described later in this report.

HGV Flow

2.3.8 Table 2.1 summarises proportion of HGV flow as a percentage of total volume; as recorded by the Automatic Traffic Counts on the main radial routes into Ashbourne over both an average day and during the hours during which pedestrian demand within Ashbourne is likely to be at its highest (i.e. the core shopping hours).

Location	24 Hour HGV %	10am – 4pm HGV %
A515 Buxton Road	6.8	7.1
Cokayne Lane	1.5	1.6
A517 Belper Road	3.6	4.5
A52 Derby Road	2.6	3.0
A515 Clifton Road	4.4	5.3
Mayfield Road	1.4	1.9

Table 2.1: Average HGV % in Ashbourne

Seasonal Changes

2.3.9 As could be expected, traffic volumes vary from month to month during the year. In highway engineering terms, the months of April, May, June, September and October are known as neutral months, as they are less likely to be affected by seasonal changes in flow than other months.

2.3.10 Table 2.2 below, reflects this change as recorded at permanent traffic count site close to Ashbourne, using March, April and October to represent neutral months and July, August and December as non-neutral months representations. All counts were conducted in 2007.

	Mar	Apr	Oct	July	Aug	Dec
	Neutral			Summer (Non N.)		Winter (Non N.)
5 day Average	4,838	5,471	4,996	5,337	6,119	4,105
Seasonal Average Flow	**5,102**			**5,728**		**4,105**

Table 2.2: A515 two way seasonal traffic volumes in Ashbourne

2.3.11 As the traffic volumes above indicate, there is an average two way flow of 5,102 vehicles along the A515 in neutral months, compared to 5,728 in the summer and 4,105 in winter months.

2.3.12 A factor of 1.12 is therefore appropriate to estimate traffic volumes during a summer season (i.e. traffic flow is 12% higher at these times of year than in neutral months, during which period the traffic counts were conducted).

2.3.13 The assessments in this report are based on the assessments of peak hours. As such, a comparison of the seasonal changes to the overall weekday average peak hours has also been conducted. This also shows a seasonal increase in peak hour flow of approximately 12%.

3 Policy Context

3.1 Overview

3.1.1 Any amendment to the current transport provision and route infrastructure in Ashbourne would require the use of public funds (likely from the current Local Transport Plan) and, as such, would need to be consistent with National, Regional and Local Policy.

3.1.2 Given the above, a review of the following documents has been undertaken to place this study within an appropriate policy context, with particular focus upon issues of congestion:

- Planning Policy Guidance 13: Transport (PPG13),
- East Midlands Regional Spatial Strategy (RSS8),
- Derbyshire Local Transport Plan 2006-2011,
- Derbyshire Dales District Council Local Plan.

3.2 National Policy

Planning Policy Guidance PPG13: Transport (PPG13)

3.2.1 PPG13 sets out the Government's policy with regards the provision of transport. The three key objectives of PPG13 are to;

1. Promote more sustainable transport choices for both people and for moving freight;
2. Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling, and
3. Reduce the need to travel, especially by car.

3.2.2 With respect to traffic management, PPG13 states that with well designed traffic management measures, local authorities can contribute to planning objectives in a number of ways, including;

- Reducing community severance, noise, local air pollution and traffic accidents;
- Promoting safe walking, cycling and public transport across the whole journey;
- Improving the attractiveness of urban areas and allow efficient use of land;
- Helping to avoid or manage congestion pressures which might arise in central areas from locational policies;
- Resident parking schemes and other controls to avoid on-street parking in areas adjacent to developments with limiting on-site parking; and,
- Producing better and safer local road conditions in rural areas and reducing the impacts of traffic in sensitive locations, while facilitating the access that is important to maintaining a vibrant rural economy.

3.3 Regional Policy

Regional Spatial Strategy for the East Midlands (RSS8) (Sept 2006)

3.3.1 The Regional Spatial Strategy (RSS), guides development at a regional level until 2026. This strategy is being used by local authorities during the preparation of their Local Development Frameworks (LDFs).

3.3.2 The RSS also contains the Regional Transport Strategy; Policy 42 which states that local authorities should have regard to the following objectives when drawing up their Local Transport Plans and Local Development Framework Documents:

- Support sustainable development in the region's Principal Urban Areas and Sub-Regional Centres described in Policy 5.
- Promote accessibility and overcome peripherally in the region's rural areas in support of Policy 6.
- Support the region's regeneration priorities outlined in Policy 21.
- Promote improvements to inter-regional and international linkages that will support sustainable development within the region.
- Improve safety across the region and reduce congestion, particularly within the region's Principal Urban Areas and on major inter-urban corridors.
- Promote opportunities for modal shift away from the private car and road based freight transport across the region.

3.3.3 An identified action of the RSS is outlined in **Policy 44** which states that local authorities, public, local bodies and service providers should work together to achieve a progressive reduction over time in the rate of traffic growth in the East Midlands and support delivery of the national PSA congestion target. This should be achieved by promoting measures to:

- Encourage behavioural change, as set out in Policy 45 (sustainable travel);
- Reduce the need to travel
- Restrict unnecessary car usage
- Manage the demand for travel
- Significantly improve the quality and quantity of public transport; and
- Encourage cycling and walking for short journey.

3.3.4 Ashbourne falls within the 'Peak Sub-area Priorities'; an area which comprises the Peak District National Park and adjacent areas outside the Park boundary.

3.3.5 **Policy 11** outlines spatial priorities for development outside the Peak National Park, which includes Ashbourne in aims to meet the needs whilst reducing past levels of in-migration, discouraging additional commuting to, and supporting the regeneration of the nearby conurbations. There is also emphasis on care that must be taken to ensure new development respects the high quality environment of the area and noticeably the built heritage, with particular emphasis on Ashbourne.

3.3.6 This Plan also refers to Derbyshire County Council considering development of the A515 Ashbourne by-pass as part of a potential scheme for improvement. This arises from the recognised issue that:

- The conservation area and local roads suffer greatly from congestion caused both by tourist traffic and heavy lorries struggling up the steep and narrow A515.

3.3.7 Constructing a by-pass, linking the A52 with the A515 would be expected to remove all but local traffic from the town, creating safer conditions. Current preference for location by the County Council is an outer western alignment between the A52 west of the town and the A515 to its north. The Plan notes that Investigation into alignment for this scheme is still at a relatively early stage at present.

3.4 Local Policy

Derbyshire Local Transport Plan 2006-2011

3.4.1 The objectives of the Derbyshire Local Transport Plan are given, below.

- Effective maintenance and management,
- Improve local accessibility and healthier travel options,
- Provide safer roads and communities,
- Reduce congestion and create a strong local economy,
- Provide better air quality and environment.

Derbyshire Dales District Council Local Plan (2002)

3.4.2 Planning policy at the most local level is currently undergoing a transition from the Local Plan system to the Local Development Framework system. However, at present, the Local Plan remains the most relevant document to the management of development within Ashbourne.

3.4.3 Relevant applications of this plan are summarised in the following policies found in Chapter 7 (Transportation) of the Local Plan:

- To create an environment that ensures new development contributes towards the overall reduction in the reliance of the private car;
- To facilitate the integration of new development with the existing public transport, cycling and pedestrian network;
- To facilitate the development of extensions to the existing public transport, cycling and pedestrian network;
- To ensure that highway safety is not compromised by new development; and
- To safeguard land necessary for the implementation of transportation projects that contribute to the achievement of sustainable development.

3.5 Summary and Relation to Ashbourne Town Centre

3.5.1 National, regional and local policy all reflects the requirement to accommodate traffic movements on the highway network; under the provision that environmental and community impacts of such movement are minimised or mitigated.

3.5.2 The importance of reducing congestion is specifically highlighted at a national level. However, such reduction should not occur at the expense of non-car modes.

3.5.3 With respect to Ashbourne town centre, the prevailing policy context means that any improvement to private vehicular traffic flow should not be at the expense of maintaining good public transport, cycle or pedestrian accessibility.

4 Measuring the Performance of the Existing Traffic System

4.1 Model Form

4.1.1 A *TRAffic Network StudY Tool* (TRANSYT) model of the existing traffic system has been developed in order that the Options identified in this report (as detailed in Section 7) can be tested in a comparative manner.

4.1.2 TRANSYT is the industry-standard tool for modelling linked signal junctions, although it does have the capacity to model priority junctions (such as T-junctions or roundabout entries). As such, it is suitable for modelling a network of streets as exists in Ashbourne town centre.

4.1.3 The model was developed following a site visit in which saturation flows were measured, and lane widths recorded, at the key junctions within Ashbourne.

4.2 Performance during a Neutral Month

4.2.1 Link capacity results are provided in Appendix B. These confirm that the key constraint to the highway network is between the Sturston Road / Derby Road, and Park Road / Belper Road signalled junction.

4.2.2 Table 4.1 summarises the results of the TRANSYT output. Within TRANSYT, a Degree of Saturation (DoS) above 90% indicates that a junction approach is nearing its practical capacity; although TRANSYT will optimise the network such that values between 90 – 95% are not uncommon. Above 100%, a junction approach is operating above capacity, and associated queues could be expected to elongate rapidly.

Table 4.1: Current Ashbourne Traffic System TRANSYT Results

Link	AM		PM	
	Degree Of Saturation (%)	Mean Max Queue (PCU)	Degree Of Saturation (%)	Mean Max Queue (PCU)
A515 Buxton Road Approach	64	2	84	8
Church Street Left Turn	20	0	26	0
Church Street Ahead	3	0	4	0
A515 Buxton Road Exit	20	0	26	0
Cokayne Avenue Approach	14	0	16	0
Park Road Northbound (Into Cokayne Av)	15	0	12	0
St. Johns Street	80	4	96	12
Cokayne Avenue Exit	20	0	15	0
Belper Road Approach	78	8	71	6
Sturston Road Eastbound	77	8	94	13
Park Road Sourthbound (Into Belper Rd / Sturston Rd)	82	10	110	62
Belper Road Exit	12	0	19	0
Sturston Road Westbound	156	165	173	216
Derby Road Approach	203	140	172	99
Station Street Eastbound	50	4	64	6
Dig Street Southbound	15	1	42	2
Derby Road Exit	12	0	12	0
Old Derby Road / Old Hill Exit	5	0	10	0
Clifton Road Approach	68	1	85	5
Station Road Southbound (Into Clifton Rd / Station St)	8	0	41	2
Station Street Westbound	29	0	31	0
Clifton Road Exit	13	0	18	0
Compton Street Approach	20	1	55	3
Station Road Northbound (Into Compton St / Station Rd)	24	2	29	3
Station Road Southbound (Into Compton St / Station Rd)	3	0	12	1
Compton Street Exit	1	0	1	0
Mayfield Road	9	0	20	0
Churchstreet Westbound	1	0	1	0
Station Road Northbound (Into Mayfield Rd / Church St)	30	2	45	3
Mayfield Road Exit	2	0	3	0
Dig Street Northbound	47	3	39	2
Church Street Eastbound (Into Church Street Eastbound O/W)	44	3	76	8
Park Road Southbound	37	2	45	2
Park Road Northbound	24	0	20	0

4.2.3 In considering the results, it should be noted that TRANSYT applied a "flat" profile to the traffic flows (i.e. it assumes traffic arrives at a junction evenly throughout the period being modelled). As noted in Section 2 this is not the case in Ashbourne during the AM peak. As such, there would be a short period during the AM peak hour during which the system operates less well than is reported in Table 4.1.

4.2.4 However, notwithstanding the above, the model matches the on-site observation with queuing noted in the locations shown on Figure 1.2.

4.3 Performance during the Summer Season

4.3.1 As noted in Section 2, traffic flow during the summer season could be 12% higher than during a neutral month.

4.3.2 Assessment of Government funded transport schemes requires the use of analysis and assessment based on neutral months such that short-term seasonal variances do not unduly distort potential costs and benefits. However, given that Ashbourne is both a tourism destination in itself and a gateway to the Peaks, a factor of 1.12 has been applied globally within the TRANSYT model to produce a representation of the performance of the system during the Summer season. These results are given in Table 4.2, below.

4.3.3 As could be expected, this Table shows a worsening of conditions over that described in Table 4.2 particularly on St. John's Street.

Table 4.2: Current Ashbourne Traffic System TRANSYT Results (with Summer Factor applied)

Link	AM		PM	
	Degree Of Saturation (%)	Mean Max Queue (PCU)	Degree Of Saturation (%)	Mean Max Queue (PCU)
Hall Lane Approach	74	3	97	17
Church Street Left Turn	22	0	28	0
Church Street Ahead	3	0	4	0
Hall Lane Exit	22	0	28	0
Cokayne Avenue Approach	15	0	17	0
Park Road Northbound (Into Cokayne Av)	17	0	13	0
St. Johns Street	94	11	112	51
Cokayne Avenue Exit	22	0	16	0
Belper Road Approach	92	12	75	7
Sturston Road Eastbound	88	11	97	15
Park Road Sourthbound (Into Belper Rd / Sturston Rd)	89	13	119	93
Belper Road Exit	13	0	19	0
Sturston Road Westbound	175	218	175	220
Derby Road Approach	228	173	193	127
Station Street Eastbound	56	5	72	7
Dig Street Southbound	16	1	47	2
Derby Road Exit	12	0	13	0
Old Derby Road / Old Hill Exit	5	0	10	0
Clifton Road Approach	77	2	96	15
Station Road Southbound (Into Clifton Rd / Station St)	9	0	49	2
Station Street Westbound	29	0	32	0
Clifton Road Exit	14	0	19	0
Compton Street Approach	20	1	40	3
Station Road Northbound (Into Compton St / Station Rd)	26	2	41	4
Station Road Southbound (Into Compton St / Station Rd)	3	0	17	1
Compton Street Exit	1	0	1	0
Mayfield Road	9	0	22	0
Churchstreet Westbound	1	0	1	0
Station Road Northbound (Into Mayfield Rd / Church St)	33	3	52	5
Mayfield Road Exit	3	0	3	0
Dig Street Northbound	47	3	64	3
Church Street Eastbound (Into Church Street Eastbound O/W)	49	3	69	8
Park Road Southbound	42	3	47	3
Park Road Northbound	27	0	22	0

5 Proposed Future Development

5.1.1 Any traffic system alterations proposed would need to accommodate traffic that could be generated by future developments (notwithstanding any mitigation identified as being required to facilitate such development). As such, the Local Planning Authority (LPA), Derbyshire Dales District Council, has been contacted in order to identify those developments that may require consideration.

Proposed Development of 40 housing units (100% affordable) off Belper Road (A517) near Nether Sturston

5.1.2 The number of trips during the AM and PM peak hours has been estimated using the *Trip Rate Information Computer System* (TRICS) which is a database of traffic surveys conducted at sites across the UK and Ireland. The TRICS database has been examined to identify sites with similar characteristics to Ashbourne, and use this as the basis for traffic forecasting.

5.1.3 This has estimated that this development could generate 34 trips in the AM peak hour and 50 trips in the PM peak hour. These trips have been distributed across the Ashbourne highway network using the 2001 Census *Journey to Work* data (residential trip destinations)[1].

Proposed development of 80 housing units (100% affordable) located on the an airfield off Stanton Road, from the A52

5.1.4 Again, the trips for this development have been estimated using TRICS, and distributed across the network using 2001 Census Journey to Work data. This development could generate 68 trips in the AM peak hour and 100 in the PM peak hour. Again, these trips have been distributed across the Ashbourne highway network using the 2001 Census *Journey to Work* data (residential trip destinations).

Proposed development of a 50 room hotel and pub / restaurant located off the A52 (between the junctions with the A515 Clifton Road and Mayfield Road)

5.1.5 Again, the trips for this development have been estimated using TRICS. This development could generate 26 trips in the AM peak hour and 27 in the PM peak hour. This is probably an overestimate given that some of the trips would be “pass-by” opportunistic trips and, as such, is considered to be robust.

[1] The Journeys to Work represent approximately 1/3 of trips in the AM and PM peak hours and as such, this data is considered to be appropriate as a proxy to estimate trip ends.

Industrial / Airfield area off the A52

5.1.6 Information on this potential development is limited to that information contained within the local plan. However, considering a development scenario of equal measures B1 (Business Park), B2 (Industrial) and B8 (Warehousing) usage gives trip generation estimates of 533 two-way trips in the AM peak hour and 414 trips in the PM peak hour. These trips have been distributed across the network using the 2001 Census Journey to Work data (employment trip origins).

5.1.7 It should be noted that a firm development proposal could amend the estimated trip generation, given above.

5.1.8 It is noted that development of this site is dependant on securing a new access.

Clifton Road

5.1.9 Again, information on this potential development is limited to that information contained within the local plan. However, considering a development scenario of equal measures B1 (Business Park), B2 (Industrial) and B8 (Warehousing) usage gives trip generation estimates of 104 two-way trips in the AM peak hour and 81 trips in the PM peak hour. Again, these trips have been distributed across the network using the 2001 Census Journey to Work data (employment trip origins).

5.1.10 It should be noted that a firm development proposal could amend the estimated trip generation, given above.

Nestle Site

5.1.11 The former Nestle site is being developed. As such, a visual inspection has been conducted and compared to the development scenario contained within the Transport Assessment contained within planning application for this site. This shows that there could be an additional 211 two-way trips in the AM peak hour and 197 trips in the PM peak hour attributable to the remanding development potential of the site. These have been distributed across the network as per the Transport Assessment used to support the development.

Application to this Study

5.1.12 Table 5.1 show the performance of the base highway network (during a neutral month) with these additional trips loaded. However, given the uncertainty with regards several of the local plan developments and any mitigation packages that would be brought forward alongside any application, these results are for illustration only. However, they show a general worsening of queuing within the town centre; particularly on St. John's Street.

Table 5.1: Current Ashbourne System TRANSYT Results (with allowance for proposed development))

Link	AM		PM	
	Degree Of Saturation (%)	Mean Max Queue (PCU)	Degree Of Saturation (%)	Mean Max Queue (PCU)
A515 Buxton Road Approach	83	6	97	16
Church Street Left Turn	21	0	28	0
Church Street Ahead	3	0	4	0
A515 Buxton Road Exit	21	0	28	0
Cokayne Avenue Approach	17	0	17	0
Park Road Northbound (Into Cokayne Av)	16	0	12	0
St. Johns Street	105	31	103	28
Cokayne Avenue Exit	20	0	16	0
Belper Road Approach	88	12	75	8
Sturston Road Eastbound	72	8	97	17
Park Road Sourthbound (Into Belper Rd / Sturston Rd)	112	60	126	118
Belper Road Exit	14	0	21	0
Sturston Road Westbound	193	271	178	229
Derby Road Approach	237	184	238	186
Station Street Eastbound	55	5	75	7
Dig Street Southbound	18	1	44	2
Derby Road Exit	14	0	14	0
Old Derby Road / Old Hill Exit	4	0	9	0
Clifton Road Approach	76	2	100	22
Station Road Southbound (Into Clifton Rd / Station St)	9	0	46	2
Station Street Westbound	28	0	31	0
Clifton Road Exit	13	0	18	0
Compton Street Approach	21	1	55	3
Station Road Northbound (Into Compton St / Station Rd)	25	2	34	3
Station Road Southbound (Into Compton St / Station Rd)	3	0	12	1
Compton Street Exit	1	0	1	0
Mayfield Road	9	0	20	0
Churchstreet Westbound	1	0	1	0
Station Road Northbound (Into Mayfield Rd / Church St)	32	2	51	5
Mayfield Road Exit	2	0	3	0
Dig Street Northbound	44	3	38	2
Church Street Eastbound (Into Church Street Eastbound O/W)	47	3	86	11
Park Road Southbound	46	2	49	2
Park Road Northbound	25	0	21	1

6 Options for Improvement

6.1 Overview

6.1.1 The current traffic system within Ashbourne has been examined and a range of potential options have been identified that could assist in the improvement of the existing system. These options have been examined in terms of their effect on junction capacity (using TRANSYT) and in terms of their geometric deliverability, as appropriate.

6.1.2 The options have been grouped into two categories;

"Do Minimum" Schemes	that would assist the management of the existing congested system, but would not lead to significant increases in network capacity,
"Do Something" Schemes	that are more fundamental interventions (in terms of traffic management etc,) that could lead to improvements in network capacity.

6.2 "Do Minimum" Interventions

6.2.1 From the scoping study, it was identified that the key constraint on the internal capacity of the Ashbourne traffic system was that of the Derby Road / Sturston Road / Park Road / Belper Road linked-signal system.

6.2.2 However, in traffic management terms, any options for the wider improvement of the system must first consider the accommodation of traffic to and from the A515 (Buxton Road), given that this is the focus of the current traffic management system.

St. John's Street

6.2.3 St. John's Street is relatively narrow, and (from observation) accommodates a high number of pedestrians to and from the retail opportunities in this area. The retail outlets also create a demand for loading and unloading movements, further restricting width.

6.2.4 It is noted that existing pedestrian footway widths are also narrow.

6.2.5 As noted earlier, St. John's Street is currently one-way eastbound from its junction with Dig Street to its junction with Cokayne Avenue.

6.2.6 For the reasons noted above, it is recommended that, within the "Do Minimum", the one-way operation of St. John's Street is maintained.


Photographs 6.1: St. John's Street; showing narrow carriageway and footway, and loading movements

The A515 (Buxton Road)

6.2.7 The A515 enters Ashbourne on a steep gradient and, as noted in Section 2, accommodates a relatively high proportion of HGVs. It joins St. John's Street as the minor road at a simple priority junction. Given that St. John's Street is currently one-way, traffic entering the A515 has priority.

6.2.8 To the immediate north of the junction with St. John's Street, is a small car park which is not used on market days (as it forms the area in which the market takes place). As such, this car park cannot be used on days when demand for parking within the town could be expected to be at its height.

6.2.9 Although no count of parking circulation was undertaken as part of this study, it was noted during site visits that this car park attracts unsatisfied parking demand and that such "space seekers" would then need to circulate locally in order to find a space.

6.2.10 The side roads of Union Street and King Street are further north, respectively, with a stagger of approximately 30m.

6.2.11 The pedestrian centres of St. John's Street and Market Square are linked by a non-carriageway route. As such, from observation, pedestrian demand in Market Square is high and movement across the A515 is catered for in the form of a signalled pedestrian crossing.

6.2.12 The key issues with respect to management of the A515 are therefore;

- keeping speed to a minimum on the descent into Ashbourne,
- minimising turning movements across the paths of ascending and descending vehicles, to avoid unnecessary stopping and starting,
- continuing to accommodate pedestrian movement.

6.2.13 It has been suggested in correspondence received by Derbyshire County Council that traffic is made to turn left onto King Street and then right onto Hall Lane in order to reach Cokayne

Avenue / Park Road; rather than route through St. John's Street. This suggestion is shown in Figure 6.1.

6.2.14 This potential option has been examined via an investigatory site visit. This option would mean that traffic (including HGVs) are (1) asked to make up an additional turn, (2) would route onto streets with residential properties and (3) would use Hall Lane (which is narrow, is used by pedestrians but has no footway for most of its length). For these three reasons, it is not considered that this option would be appropriate. As an additional point, and one with which a view is taken later in this report, King Street would have to be made one-way to accommodate the swept path of an HGV making a left turn into this road.

6.2.15 It has also been suggested that Union Street and North Avenue are used by northbound A515 traffic. However, as noted during the investigatory site visit, these streets are principally residential and, as such, are not considered to be suitable for the accommodation of additional through traffic.

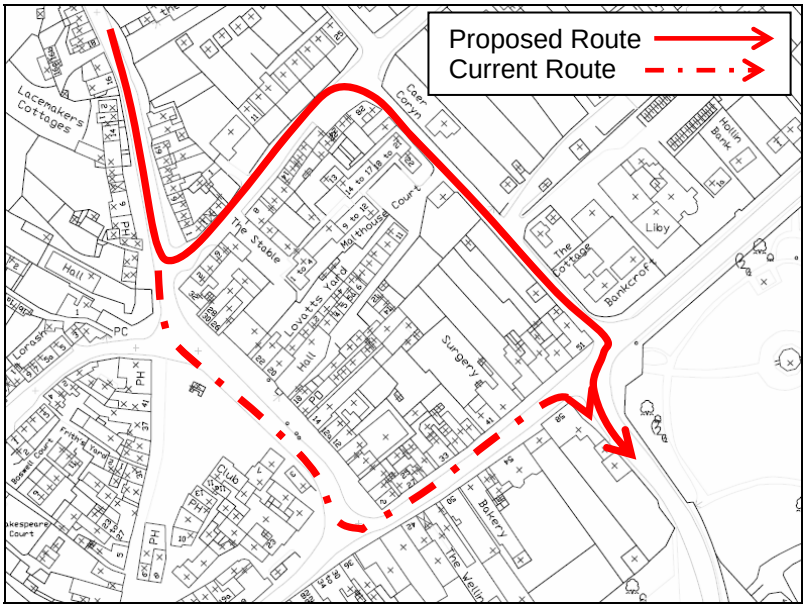


Figure 6.1: Alternative route for Traffic into Ashbourne town centre by HGVs (Reproduced from Ordnance Survey digital map data © Crown copyright 2006. All rights reserved. License number 0100031673)

6.2.16 <u>For the reasons noted above, it is recommended that, within the "Do Minimum";</u>

- The Market Square car park is closed, and given over to pedestrian use (with the agreement of Derbyshire Dales District Council and following appropriate consultation; as it cannot be used on days of maximum parking demand now, and encourages circulating, space searching traffic,
- The A515 (Buxton Road) is treated with an anti-skid surface (both ascending and descending) on the approach to junctions, pinch-points and the existing pedestrian crossings.


Photographs 6.2: A515 (Buxton Road), descending and ascending, showing steepness of gradient

Park Road

6.2.17 At the northern end of Park Road, St. John's Street gives way to flow from Cokayne Avenue.

6.2.18 Park Road itself is wide enough to accommodate two-way traffic; and is the main access road for the Fire and Ambulance Station, as well as two car parks (one of which is a seasonal overspill car park).

6.2.19 It has been suggested in correspondence received by Derbyshire County Council that Park Road and Cokayne Avenue are made to give-way to St. John's Street. However, from an investigatory site visit, it is not considered that there is sufficient visibility from Park Road (northbound) to St. John's Street to enable the priority to be reversed (which would also require non-standard markings). However, a mini-roundabout could be introduced which would (1) retain priority for northbound traffic on Park Road over St. John's Street but (2) give priority to St. John's Street over Cokayne Avenue. Alternatively, signals could be introduced. Further consideration would be required in order to select the option that would create the least impact on the road safety record at this location.

6.2.20 It is noted that the Park Road / Belper Road junction has no pedestrian crossing facilities, other than dropped crossings.

6.2.21 As such, as a "Do Minimum", a mini-roundabout or signals could be introduced at the Park Road / Cokayne Avenue / St. John's Street junction to assist traffic flow from St. John's Street into Park Road.


Photographs 6.3: Park Road, showing sufficient highway width for current two-way traffic flow

Sturston Road / Station Street

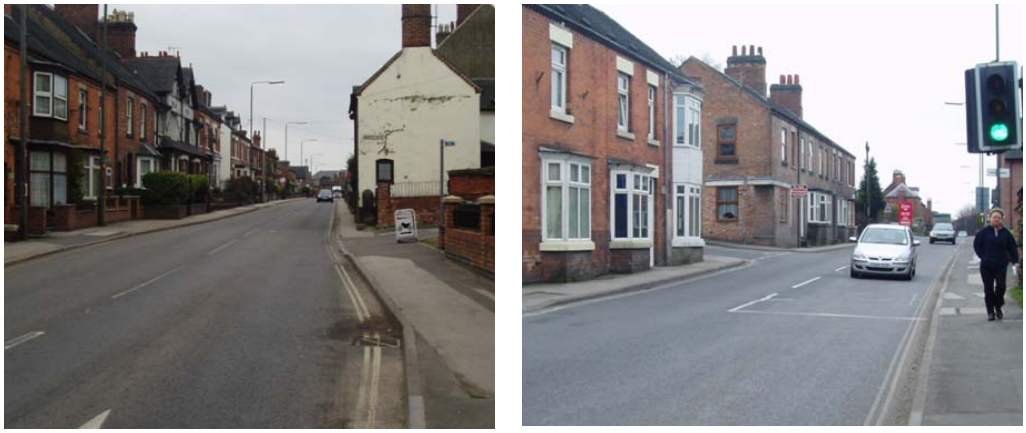
6.2.22 This route is sufficient to carry two-way traffic, though to accommodate two-way flow, footway widths are narrow.

6.2.23 The junction with Derby Road sees the confluence of five roads (though one of which is one-way). Partial pedestrian crossing provision for is provided here, though the range of potential traffic movement may be confusing for the pedestrian waiting to cross uncontrolled arms.

6.2.24 It is noted that traffic waiting to turn right into Compton Street can block the ahead movement from Park Road / Belper Road and thus reduce the overall saturation flow of the junction. The marking of the junction has been reviewed and it has been determined that there is insufficient carriageway width to introduce a right-turn waiting area within the junction without significant land-take.

6.2.25 If the right-turn into Compton Street was banned (except for buses), traffic would have to turn right onto Station Road, right onto Church Street and then right into Dig Street. These movements have been tested using AutoTRACK software and can be accommodated geometrically. The level of flow that would be reassigned is not expected to present capacity issues elsewhere on the network, but would assist flow through this junction. However, the right-turn ban would need enforcement action, as it would be difficult to constrain this movement through physical alterations to the junction.

6.2.26 However, if a right-turn ban was introduced, it would not be possible to pedestrianise Dig Street as this road would be used by traffic as the alternative route.



Photographs 6.4: Sturston Road / Station Street, showing sufficient width for two way operation (with TROs to control parking) but with narrow footway widths

Station Road

6.2.27 Station Road currently accommodates two-way traffic, and widths are sufficient to allow this. Footways are provided on both sides, with full signalled crossing made at the signalled junction entrance to Sainsbury's. The junction with Church Street is a wide priority junction, with Station Road giving way to Church Street itself.

6.2.28 A scheme has been suggested by members of the Ashbourne Over 50s organisation to extend the St. John's Street one-way system such that the stretch of Church Street between Station Road and Dig Street is made one-way eastbound. It was also suggested that the priority at the Station Road / Church Street junction be reversed (i.e. such that Church Street gives way to Station Road. These amendments were prompted following concern that it was difficult for vehicles to turn right out of Station Road at peak times.

6.2.29 Following a consideration of the traffic flows, it is considered that this extension could be made and would make little difference to the operation of the Sturston Road / Compton Street / Derby Road junction. However, it is not considered that the priority change should be made at the Station Road / Church Street junction due to reasons of road safety (i.e. it may encourage higher speeds when making the turn into Church Street from Station Road into the path of crossing pedestrians). However, the junction could be signalised on the basis that it would assist pedestrians crossing the wide Station Road junction towards the Ashbourne Leisure Centre.

6.2.30 As a "Do Minimum", no changes to Station Road are considered to be required. However, the St. John's one-way system could be extended into Church Street and the Church Street / Station Road junction could be signalised.


Photographs 6.5: Station Road, showing sufficient width for two way traffic (even with marked on-street parking)

Dig Street / Compton Street

6.2.31 Compared with much of Ashbourne, Dig Street / Compton Street is a relatively wide carriageway, serving the Police Station, Bus Station and Somerfield. Footway widths (except over the bridge) are also sufficient.

6.2.32 It has been suggested in correspondence received by the County that the northern end of Dig Street (beyond the Somerfield access) could be pedestrianised. Given the availability of the adjacent Station Road and connecting one-way road between (serving the bus station), such a scheme could be achieved, subject to detailed design.

6.2.33 However, such a scheme could not be introduced alongside a right-turn ban at the Sturston Road / Derby Road junction.


Photographs 6.6: Dig Street / Compton Street, showing wide carriage and footways

"Do Minimum" Summary

Constraints

6.2.34 The following are likely to restrict the potential for improvement to the existing system;

- the current one-way operation of St. John's Street should be maintained,
- Ashbourne is a shopping centre and therefore accommodates pedestrian movement to and from its shops, car parks and bus station (i.e. pedestrian movement is important no matter what the method of travel to the centre).

Opportunities

6.2.35 Notwithstanding the above, within the "Do Minimum", the following interventions could be made with regards to traffic management within Ashbourne;

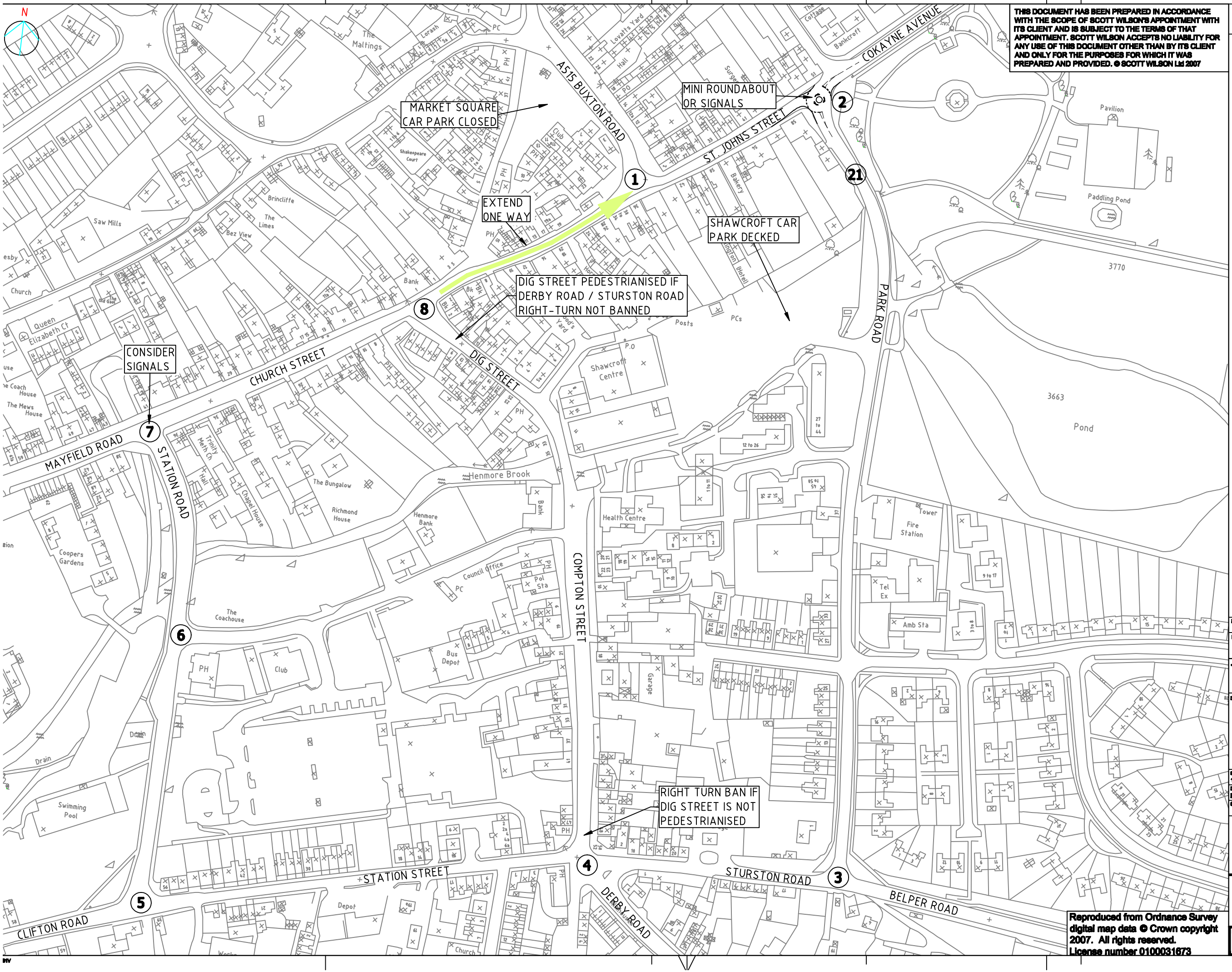
- the closure of the Market Square car park, to improve the pedestrian environment, and reduce turning and circulating traffic (with the agreement of Derbyshire Dales District Council and following appropriate consultation),
- the implementation of a mini-roundabout or signals at the Park Road / St. John's Street junction to improve movement from the latter to the former,
- the pedestrianisation of Dig Street OR the introduction of a right-turn ban at the Sturston Road / Derby Road junction.

Mitigation

6.2.36 The above Opportunities may create issues for existing users of the existing highway network. Appropriate mitigation for these effects could be to;

- provide some disabled parking spaces on the existing Market Square car park,
- increasing car parking capacity of the Shawcroft car park to compensate for loss of spaces at Market Square, via "decking" of the existing car park. This would also assist in accommodating seasonal peaks of traffic. This action would be subject to the agreement of Derbyshire Dales District Council and their funding priorities.

6.2.37 Diagrams are presented overleaf of "Do Minimum" schemes



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NOTES

(2) TRANSYT NODE NUMBER

Revision Details	By / Check	Date	Suffix

Drawing Status: **DRAFT**

Job Title: **ASHBOURNE TRAFFIC STUDY**

Drawing Title: **FIGURE 4.2**

DO MINIMUM SCHEMES

Scale at A3		
1:2000		
Drawn: DJM		Approved
Stage 1 check	Stage 2 check	Originated / Date

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Drawing Number: **D117945/TS/01** Rev

6.3 "Do Something" Interventions

Overview

6.3.1 The above part of this section described the potential to make minor improvements to the highway network. Two options have been identified to change the highway network more significantly, and these are described below.

Option 1 – Formation of a Gyratory System

6.3.2 The public correspondence files held by Derbyshire County Council contained the suggestion of a gyratory system in which traffic flows one-way around the grid that forms Ashbourne town centre.

6.3.3 This option has been taken forward for testing, on a clockwise basis, as it provides;

- a desk-top fit with the requirement to maintain the one-way operation of St. John's Street,
- the removal of opposing traffic streams at the key Sturston Road / Station Road junction,
- the ability to use full road widths to accommodate traffic movement.

6.3.4 Figure 6.2, overleaf, summarises this scheme.

6.3.5 This scheme has been modelled using TRANSYT, as per the base traffic network. These results are shown in Table 6.1. From these results it can be seen that the scheme would offer junction capacity benefits, and therefore reduction in queuing across the network as a whole; with the following junctions signalised in order to support the scheme;

- Station Road / Station Street,
- Cokayne Avenue / St. John's Street / Park Road,
- Church Street / Station Road.

6.3.6 In terms of road geometry, this scheme could be accommodated within the existing highway; which is as expected given that the majority of the network is currently operates as a two-way network.

6.3.7 In terms of reassignment potential, it is not considered that there would be significant adverse routeings – the potential to re-route from Cokayne Avenue to the A515 (Buxton Road) would be as at present (via Windmill Lane or The Green Road) though the town centre network would be less congested (at junctions).

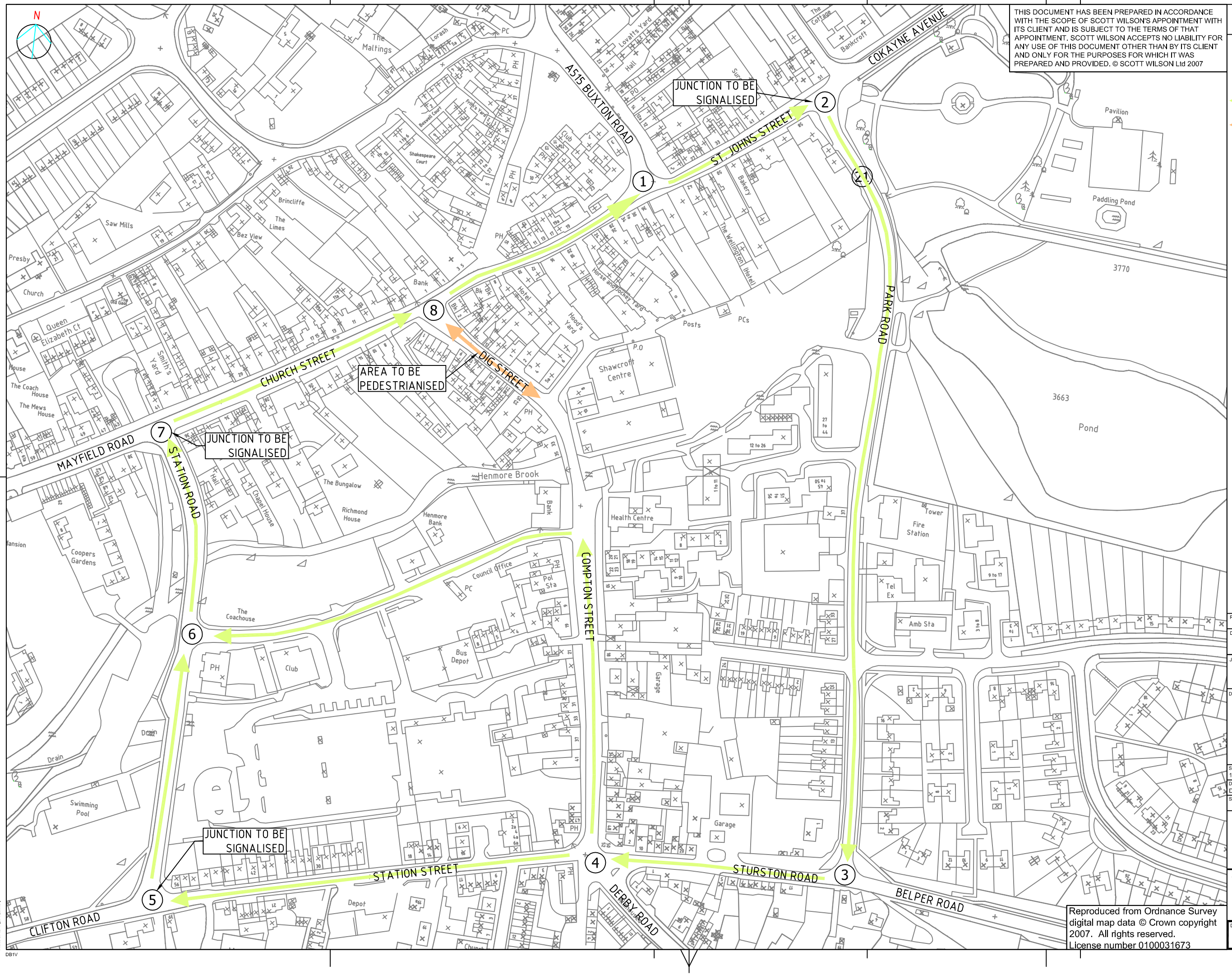
6.3.8 However, it should be noted that, by its nature, this option would increase traffic flow within the retail area of the town centre, particularly along St. John's Street (by 150.7% in the AM peak and 149.1% in the PM peak), given that flow from origins such as Derby Road and the A515 to

6.3.9 The increase in flow passed the A515 (Buxton Road) / St. John's Street junction would lead to increased queuing on the A515 compared with the existing network; and the Sturston Road / Derby Road junction would still be congested in the PM peak; with queues on Park Road (partially) displaced by the signals at the junction with St. John's Street to Cokayne Avenue.

6.3.10 This option may also lead to increased response times from the Emergency Services, given the additional distances which they would be required to travel to some destinations.

Table 6.1: Option 1 TRANSYT Results

Link	AM		PM	
	Degree Of Saturation (%)	Mean Max Queue (PCU)	Degree Of Saturation (%)	Mean Max Queue (PCU)
A515 Buxton Road Approach	70	3	91	14
Church Street Left Turn	26	0	31	0
Church Street Ahead	45	0	54	1
A515 Buxton Road Exit	26	0	31	0
Cokayne Avenue Approach	82	8	100	15
St. Johns Street	83	11	98	26
Cokayne Avenue Exit	23	0	19	0
Belper Road Approach	81	12	89	12
Park Road Sourthbound (LT Into Belper Rd)	15	0	21	0
Park Road Sourthbound (RT Into Sturston Rd)	61	9	86	16
Belper Road Exit	15	0	21	0
Sturston Road Westbound (Left Turn Lane)	71	10	85	16
Sturston Road Westbound (Ahead & Right Lane)	93	19	101	35
Derby Road Approach	87	15	90	14
Dig Street Northbound	2	0	3	0
Derby Road Exit	18	0	19	0
Old Derby Road / Old Hill Exit	8	0	17	0
Clifton Road Approach	78	12	86	15
Station Street Westbound (Ahead)	21	0	28	0
Station Street Westbound (Right Turn)	66	10	57	8
Clifton Road Exit	21	0	28	0
Compton Street Approach	35	2	54	4
Station Road Northbound (Ahead)	41	12	55	14
Station Road Southbound (Ahead & Right)	58	3	55	4
Compton Street Exit	1	0	1	0
Mayfield Road	80	6	89	12
Station Road Northbound (Into Mayfield Rd / Church St)	49	3	59	5
Mayfield Road Exit	3	0	4	0
Church Street Eastbound (Into Church Street Left Turn)	33	1	42	3
Church Street Eastbound (Into Church Street Ahead)	58	3	74	9
Park Road Southbound (Into Park Rd Southbound LT)	21	2	26	2
Park Road Southbound (Into Park Rd Southbound RT)	51	6	71	8



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NOTES

(2) TRANSYT NODE NUMBER

DIRECTION OF TRAVEL FOR ONE WAY ROADS

PEDESTRIANISED AREA EXTENTS

Revision Details	By / Check	Date	Suffix

Drawing Status: DRAFT

Job Title: ASHBOURNE TRAFFIC STUDY

Drawing Title: FIGURE 6.1 OPTION 1 GYRATORY SYSTEM

Scale at A3: 1:2000

Drawn	Approved		
DJM			
Stage 1 check	Stage 2 check	Originated	Date

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Drawing Number: D117945/TS/02 Rev

Plot Date :
AutoCAD File Name :
DB1V

Option 2 – Introduction of Bus Priority

6.3.11 The Scoping Study identified that the present congestion within Ashbourne town centre resulted in delays to bus services running to and from Buxton.

6.3.12 This report has also confirmed that Station Road and Park Road are the most appropriate streets to accommodate two-way flow.

6.3.13 Option 2 would therefore seek to remove the ahead traffic on St. John's Street at its junction with the A515 (Buxton Road) and reassign this to Station Road and Park Road; in order to allow a bus contra-flow lane to be developed from the A515 (Buxton Road) to Dig Street.

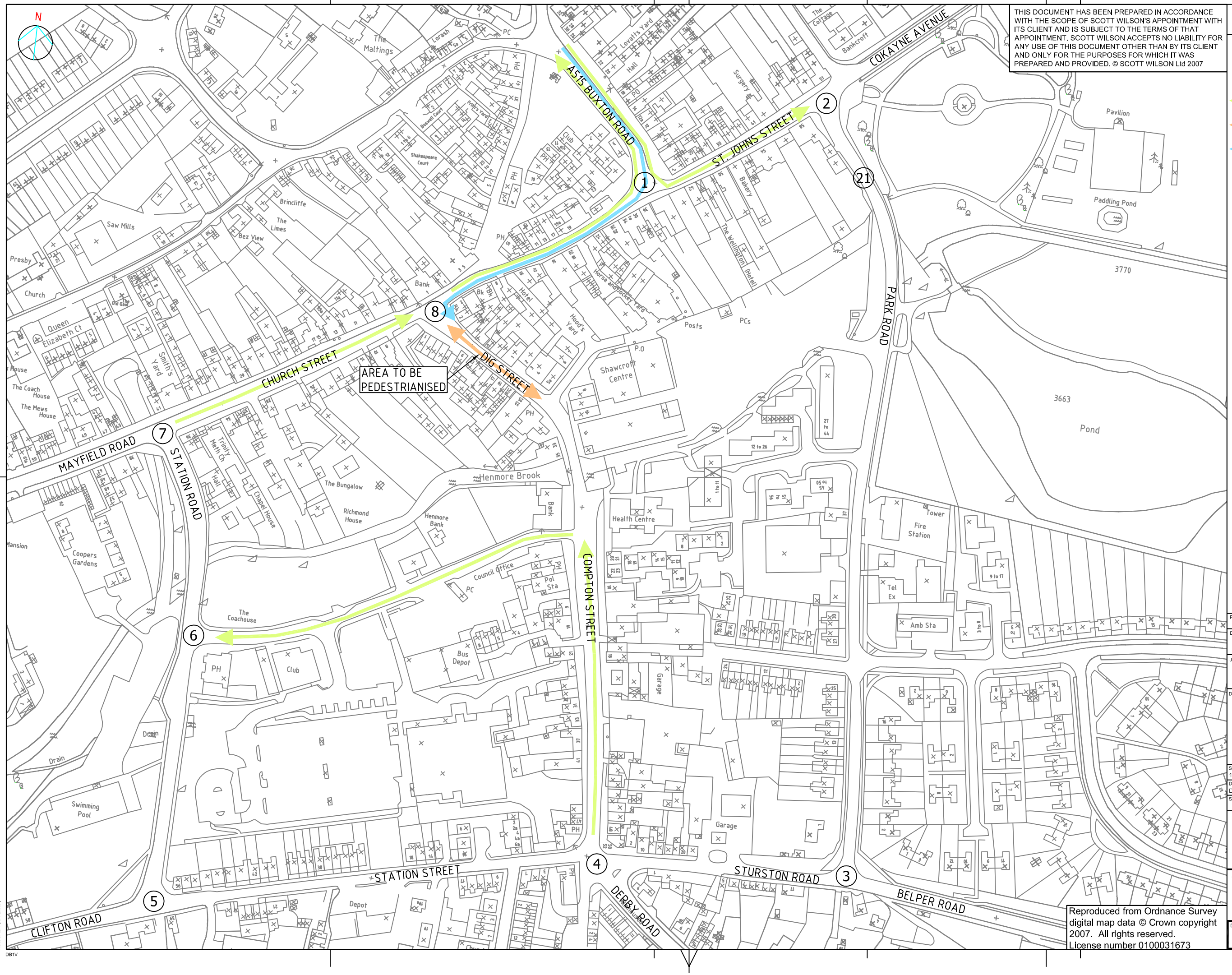
6.3.14 This is shown diagrammatically as Figure 6.3.

6.3.15 The analysis of the traffic flow data confirmed that there is a heavier eastbound flow through the Sturston Road / Station Road junction (i.e. towards Park Road) than a westbound flow (from Park Road). As such, in modelling terms, this option could be introduced with minimal additional disruption to the base traffic.

6.3.16 However, a geometrical assessment has been conducted and this has shown that there is insufficient width on St. John's Street for an HGV and a bus to pass in opposite directions. These problems are shown within Figure 6.4. Furthermore, given the loading activities that take place along St. John's Street, it is considered that this option would not be feasible.

6.3.17 This option could also have lead to some traffic "rat-running" onto The Green Road and thus increasing right-turns onto The Green Road from Buxton Road; a movement that it is sought to minimise.

6.3.18 No other options that could improve the service reliability of bus services within the existing network has been identified as part of this study.



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NOTES

(2) TRANSYT NODE NUMBER

DIRECTION OF TRAVEL FOR ONE WAY ROADS

PEDESTRIANISED AREA EXTENTS

BUS CONTRAFLOW ROUTE

Revision Details	By / Check	Date	Suffix

Drawing Status: DRAFT

Job Title: ASHBOURNE TRAFFIC STUDY

Drawing Title: FIGURE 6.2 OPTION 2 PUBLIC TRANSPORT CONTRAFLOW SYSTEM

Scale at A3: 1:2000

Drawn	Approved
DJM	

Stage 1 check	Stage 2 check	Originated	Date

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Plot Date :
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NOTES

A515 BUXTON ROAD

ST. JOHNS STREET

CHURCH STREET

DIG STREET

Shakespeare Court

Boswell Court

Bank

Hotel

Horse and Jockey Yard

Hood's Yard

Club

PH

Revision Details | By / Check | Date | Suffix

Drawing Status
DRAFT

Job Title
ASHBOURNE TRAFFIC STUDY

Drawing Title
FIGURE 6.3
OPTION 2
PUBLIC TRANSPORT CONTRAFLOW SYSTEM
AUTOTRACK ASSESSMENT

Scale at A3
1:500

Drawn	Approved		
DJM			
Stage 1 check	Stage 2 check	Originated	Date

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6.4 Summary of Options

Performance of the Highway Network

6.4.1 One option has been identified that could increase the capacity of specific junctions within Ashbourne town centre and thereby reduce queuing and the interaction of such queues on the performance of the wider network.

6.4.2 This scheme would involve the introduction of a one-way gyratory system making full use of the available road width within Ashbourne town centre.

Impact on non-car users

6.4.3 The identified option would increase traffic volumes through one of the main retail streets in Ashbourne town centre; St. John's Street. As such, this option would have a negative effect on users of this street in terms of severance (i.e. reduced informal crossing opportunities).

6.4.4 Air and noise impacts have not been assessed in this report. However, it is likely that such indicators would increase with this scheme.

Performance during Seasonal Peak Demand

6.4.5 It was noted earlier in this report that Ashbourne experiences seasonal demands in traffic flow associated with the summer season. Table 6.2 summarises the results of Option 1 with the Summer season factor of 1.12 applied.

6.4.6 As can be seen from this table, Option 1 would continue to run over capacity during the summer season (particularly during the PM peak); though with the focus of queuing moved to the A515 (Buxton Road), St. John's Street, Cokayne Avenue area of the town centre.

Table 6.2: Option 1 TRANSYT Results (with Summer factor)

Link	AM		PM	
	Degree Of Saturation (%)	Mean Max Queue (PCU)	Degree Of Saturation (%)	Mean Max Queue (PCU)
A515 Buxton Road	82	6	107	47
Church Street Left Turn	29	0	33	0
Church Street Ahead	50	0	59	1
A515 Buxton Road	29	0	33	0
Cokayne Avenue Approach	91	11	112	29
St. Johns Street	92	18	105	89
Cokayne Avenue Exit	26	0	19	0
Belper Road Approach	90	15	100	19
Park Road Sourthbound (LT Into Belper Rd)	16	0	21	0
Park Road Sourthbound (RT Into Sturston Rd)	68	10	88	17
Belper Road Exit	16	0	22	0
Sturston Road Westbound (Left Turn Lane)	80	12	89	18
Sturston Road Westbound (Ahead & Right Lane)	104	38	105	46
Derby Road Approach	98	23	101	23
Dig Street Northbound	2	0	3	0
Derby Road Exit	20	0	19	0
Old Derby Road / Old Hill Exit	9	0	18	0
Clifton Road Approach	87	15	96	22
Station Street Westbound (Ahead)	23	0	29	0
Station Street Westbound (Right Turn)	73	11	60	9
Clifton Road Exit	23	0	29	0
Compton Street Approach	39	2	56	4
Station Road Northbound (Ahead)	46	14	61	16
Station Road Southbound (Ahead & Right)	64	3	57	5
Compton Street Exit	1	0	1	0
Mayfield Road	80	6	100	19
Station Road Northbound (Into Mayfield Rd / Church St)	54	7	64	6
Mayfield Road Exit	4	0	4	0
Church Street Eastbound (Into Church Street Left Turn)	37	2	46	3
Church Street Eastbound (Into Church Street Ahead)	64	4	80	11
Park Road Southbound (Into Park Rd Southbound LT)	23	2	27	2
Park Road Southbound (Into Park Rd Southbound RT)	57	6	72	8

7 Non-Traffic Circulatory Issues

7.1.1 The scoping study identified three further issues warranting consideration as part of this study; firstly, issues relating to road safety at the Compton Street / Sturston Road / Derby Road junction; secondly, relating to the provision for pedestrians on Park Road and Dig Street / Compton Street; and, thirdly, relating to parking on Mayfield Road and The Green Road related to the school run.

7.1.2 An assessment of **road safety at the Compton Street / Sturston Road / Derby Road junction** is included within Appendix C. This concludes that, as there is insufficient room to satisfactorily remark the junction to introduce additional guidance to road users, a "Do Nothing" scenario may be appropriate in the first instance in which no measures are undertaken and the accident records are monitored to assess whether the (recent) introduction of MOVA and the subsequent reconfiguration of the phasing have addressed the road safety problem at this location.

7.1.3 In terms of the **pedestrian assessment**, the most notable issue was the number of places where delivery vehicles were parked on the footway on Dig Street, hindering movement when combined with narrow footway width.

7.1.4 In terms of crossing, the junction of Park Road and Sturston Street is poor; given the reduced sight lines, lack of pedestrian signals and heavy traffic flow. However, it is understood that the addition of a pedestrian phase here may considerably reduce capacity of an already overcapacity junction. As such, a further pedestrian crossing to the south (along Park Road, may be appropriate.

7.1.5 Further details of the assessment are given in Appendix D.

7.1.6 In terms of **parking on Mayfield Road and The Green Road** at times of school arrivals and departures, Appendix E contains a review of the problems in these locations and offers potential solutions to these issues. However, these potential solutions centre on amendments to traffic regulation orders and, as such, would require consultation with the public to ensure that they addressed the issues without creating new ones; and, if made, then would also require enforcement by the parking authority.

* * *

7.1.7 It should be noted that none of the options detailed in the preceding sections would remove traffic (including HGV traffic) from the roads within Ashbourne town centre. The question of accommodating HGV flows appears to be of particular concern to the population of Ashbourne, considering;

- the numbers of HGVs routeing through the town (especially on the A515), confirmed within this report;
- the steepness of the ascent out of, and descent into, Ashbourne town centre on the A515 (Buxton Road), highlighted in this report;
- the narrowness of some of the town centre footway widths, identified in this report;
- associated noise and air quality issues (which are outside the scope of this report).

8 Conclusions and Recommendation

8.1 Conclusions

8.1.1 It is noted that the current traffic system within Ashbourne experiences problems during the peak hours and summer season with regards to congestion; particularly between a set of linked signalled junctions at the southern edge of the town.

8.1.2 This study has sought to identify options to improve the current traffic system within Ashbourne within the prevailing policy context that improvements for private vehicular traffic should not be at the expense of non-car modes.

8.1.3 A series of “Do Minimum” improvements would not significantly improve the network capacity within Ashbourne, but would assist in the management of existing traffic flows within the existing system. A further “Do Something” option identified by this study, in which public transport accessibility to the town centre from the Buxton corridor is improved, has been ruled out on the grounds of geometrical achievability.

8.1.4 The most promising “Do Something” option relates to the creation of a one-way gyratory around Ashbourne town centre. This would provide network capacity benefits at most junctions within the town centre but would;

- likely see additional queuing on the A515 (Buxton Road) approach,
- be subject to disruption on St. John’s Street at times of loading and unloading for local shop deliveries,
- increase traffic flows through the retail heart of Ashbourne town centre, thereby increasing severance for those using the shops and services within this area,
- likely increase journey response times by Emergency services to some destinations.

8.1.5 Furthermore, Ashbourne town centre’s highway network would remain operating above capacity during the summer season with this Option in place.

8.2 Recommendation

8.2.1 Although the "Do Something" Option 1 identified in this report appears promising in network modelling terms, there remain issues with its deliverability; particularly in respect of the required increase in traffic along St. John's Street and conflicts with the commercial activity located within that part of the town centre.

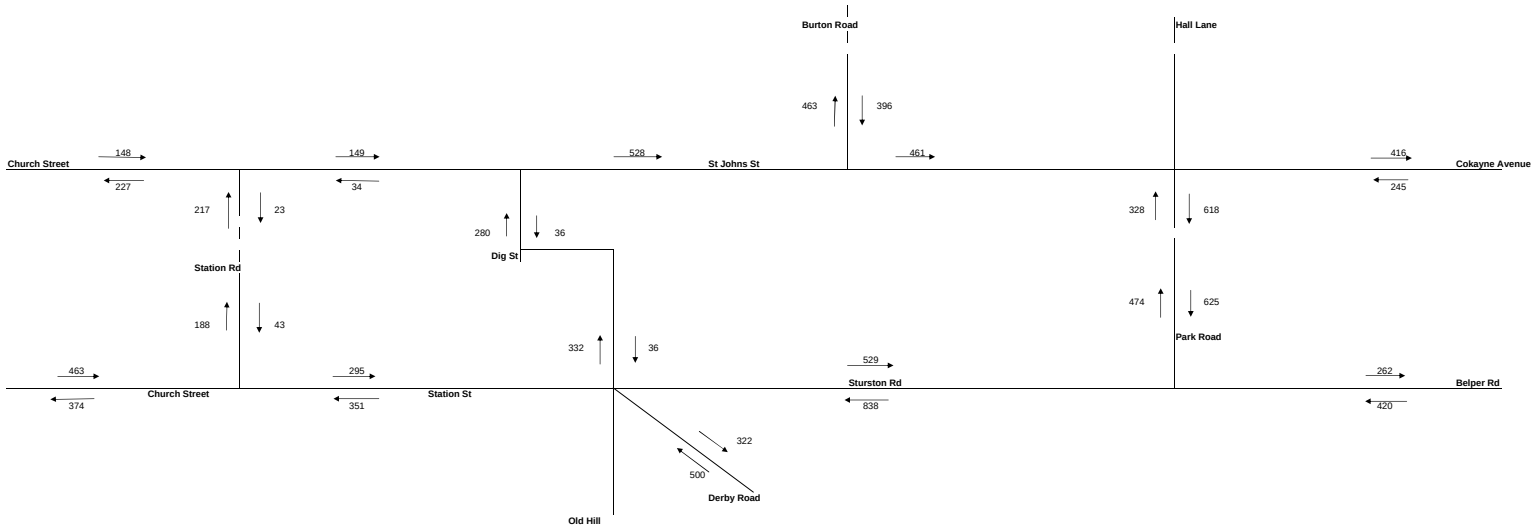
8.2.2 As such, it is recommended that the "Do Minimum" schemes are implemented, only. These are;

- Close the Market Square car park, and give to pedestrian use (with the agreement of Derbyshire Dales District Council and following appropriate consultation),
- Treat the A515 (Buxton Road) with an anti-skid surface (both ascending and descending) on the approach to junctions, pinch-points and the existing pedestrian crossings.
- Introduce a mini-roundabout or signals at the Park Road / Cokayne Avenue / St. John's Street junction,
- Introduce a right-turn ban at the Sturston Road / Derby Road junction,
- Consider extending the one-way system of St. John's Street to include a section of Church Street between Dig Street and Station Road,
- Signalise the Station Road / Church Street junction,
- Provide some disabled parking spaces on the existing Market Square car park (which would be closed to other traffic),
- Increase car parking capacity of the Shawcroft car park to compensate for loss of spaces at Market Square, via "decking" of the existing car park.

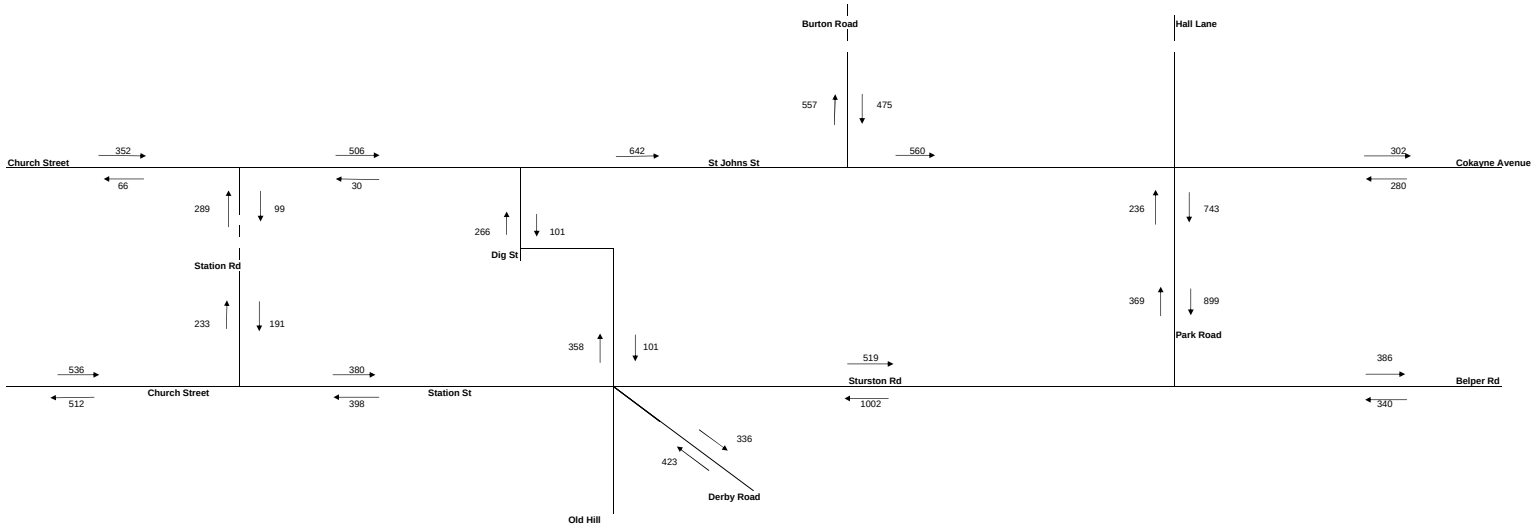
8.2.3 In addition to the above, no matter which scheme is introduced, a review of the existing directional signage within Ashbourne Town Centre would be required.

Option	Pros	Cons
"Do Minimum" Comprising 1. Ban on right turn into Compton Street. 2. Mini-roundabout or Signals at St. John's Street / Cokayne Avenue. 3. Closure of Market Square Car Park (only when mitigated by additional space at Shawcroft, and disabled-only parking at Market Square). 4. Potential extention of St. John's one-way system. 5. Signalisation of Station Road / Church Street junction	Better manage existing congestion Reduction of "shocks" to the system	Does not introduce significant additional network capacity.
Option 1 "Signalled Gyratory"	Increase in network capacity Significant reduction in queuing across network as a whole. Potential to provide additional pedestrian crossings.	Likely see additional queuing on the A515 (Buxton Road) approach, Be subject to disruption on St. John's Street at times of loading and unloading for local shop deliveries, Increase traffic flows through the retail heart of Ashbourne town centre, thereby increasing severance for those using the shops and services within this area, Likely increase journey response times by Emergency services to some destinations. Remains at capacity in Summer season,
Option 2 "Bus Priority"	Attempt to reduce public transport journey times from Buxton	NOT ACHEIVABLE DUE TO SPACE CONSTRAINTS

Appendix A
Two Way Flow Diagrams



Ashbourne Town Centre - Masterplan Devlopment Flows - Base AM



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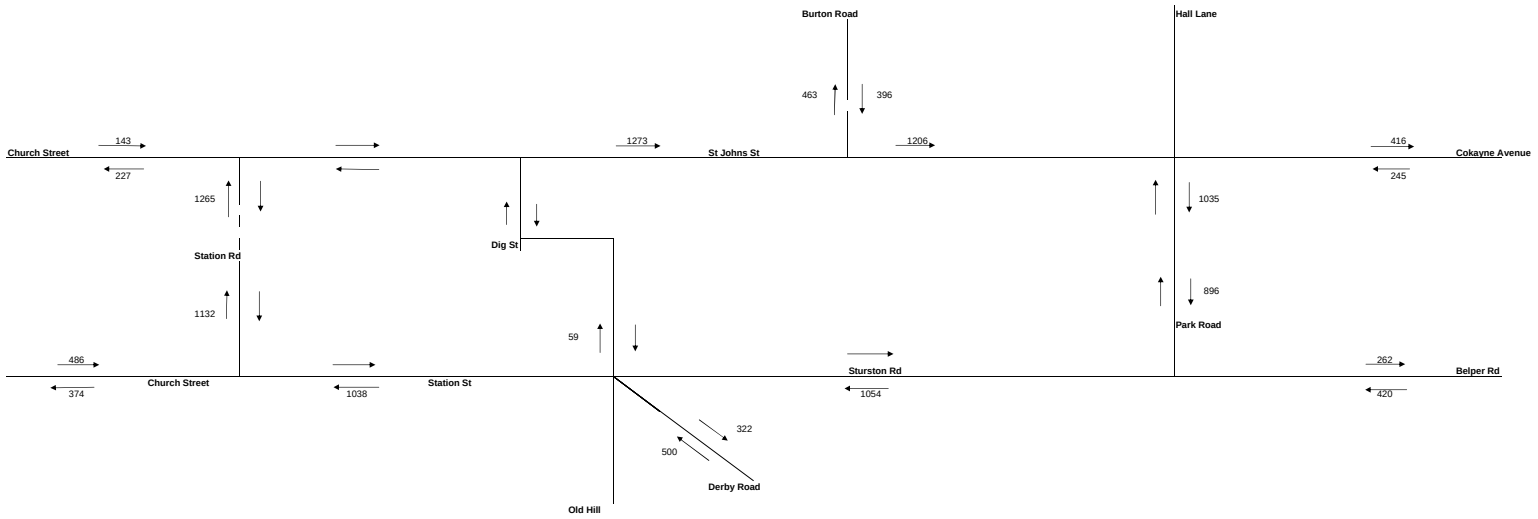
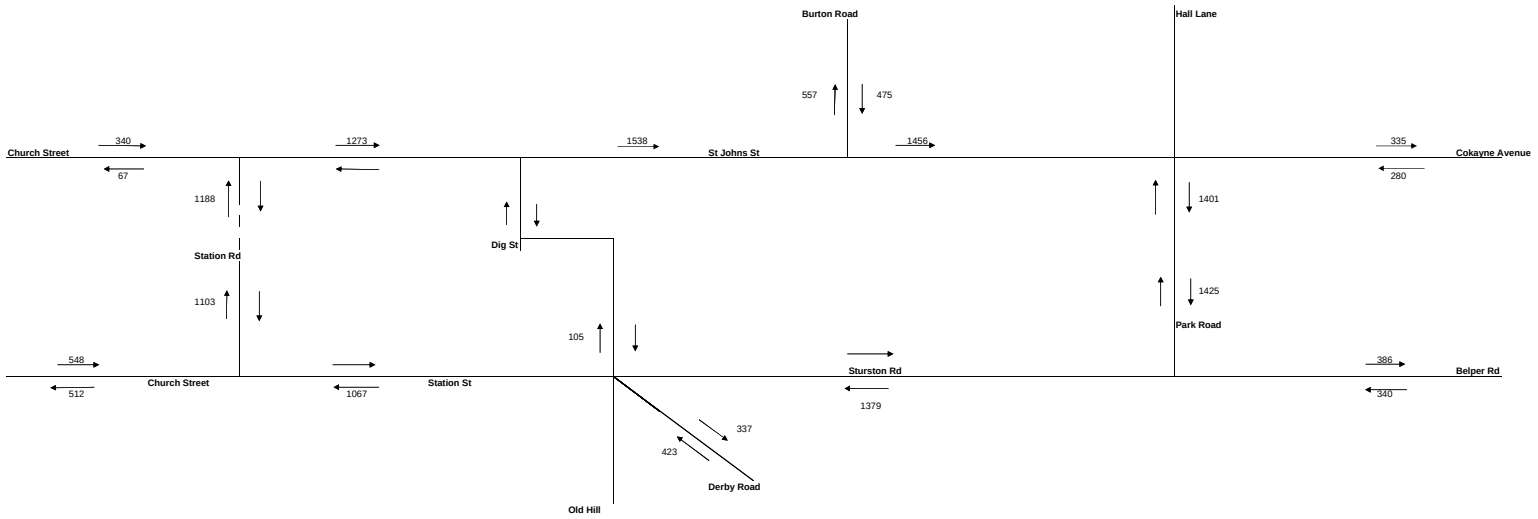
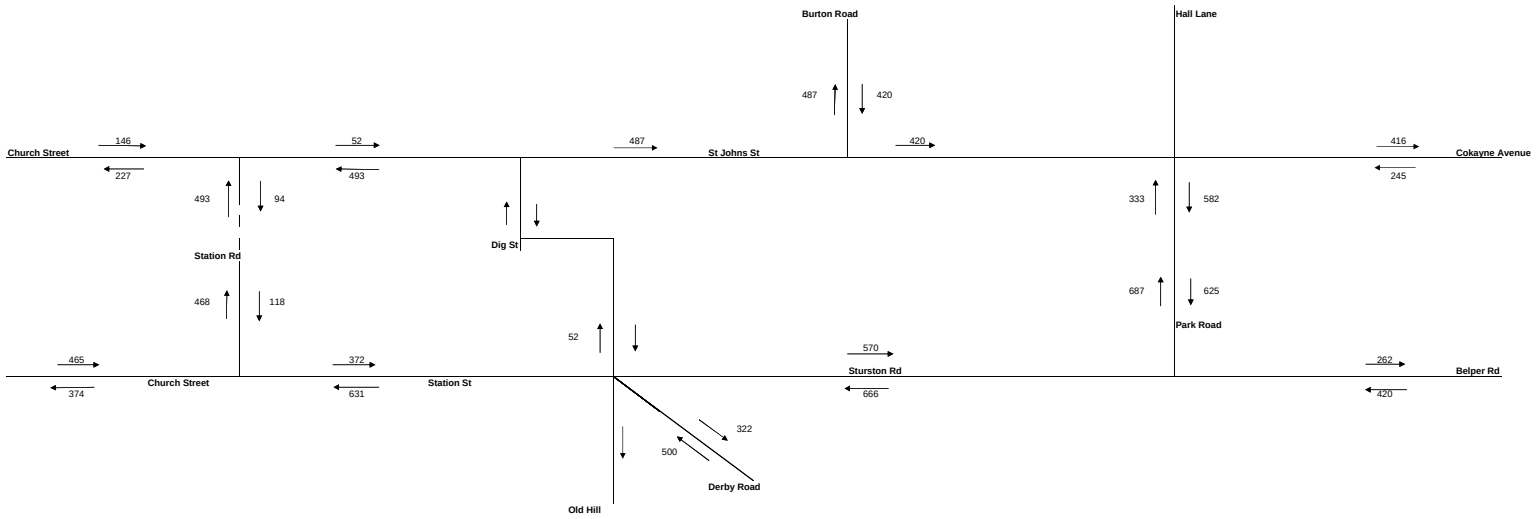


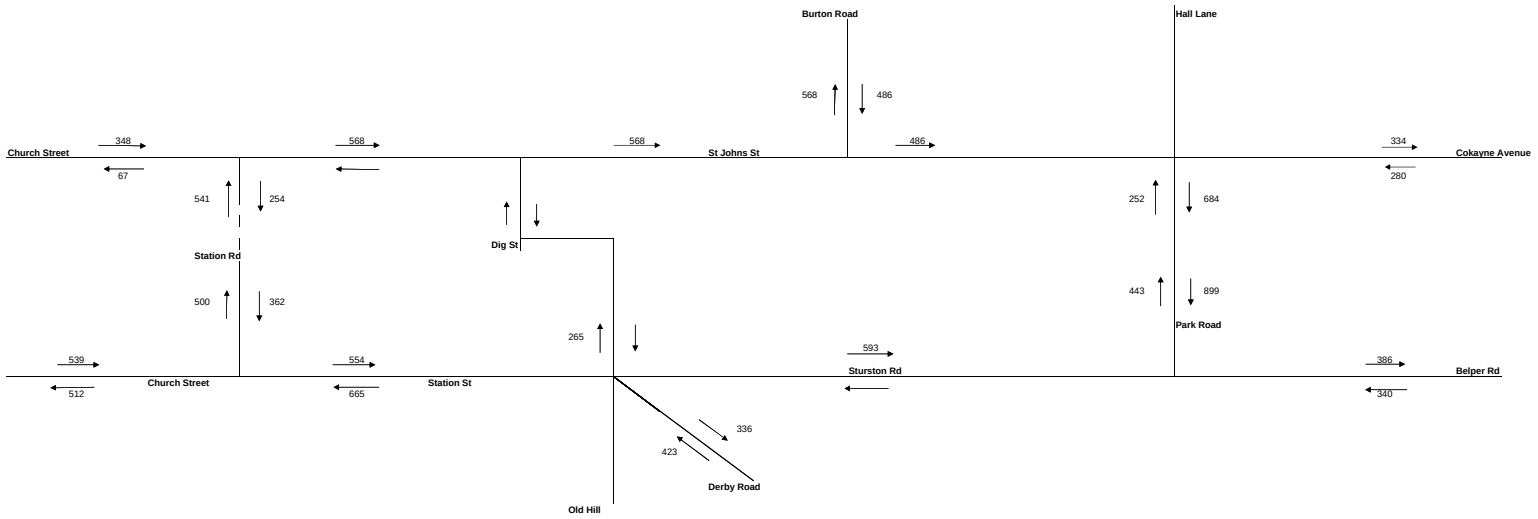
Ashbourne Town Centre - Masterplan Devlopment Flows - Option 1 AM



Ashbourne Town Centre - Masterplan Devlopment Flows - Option 1 PM

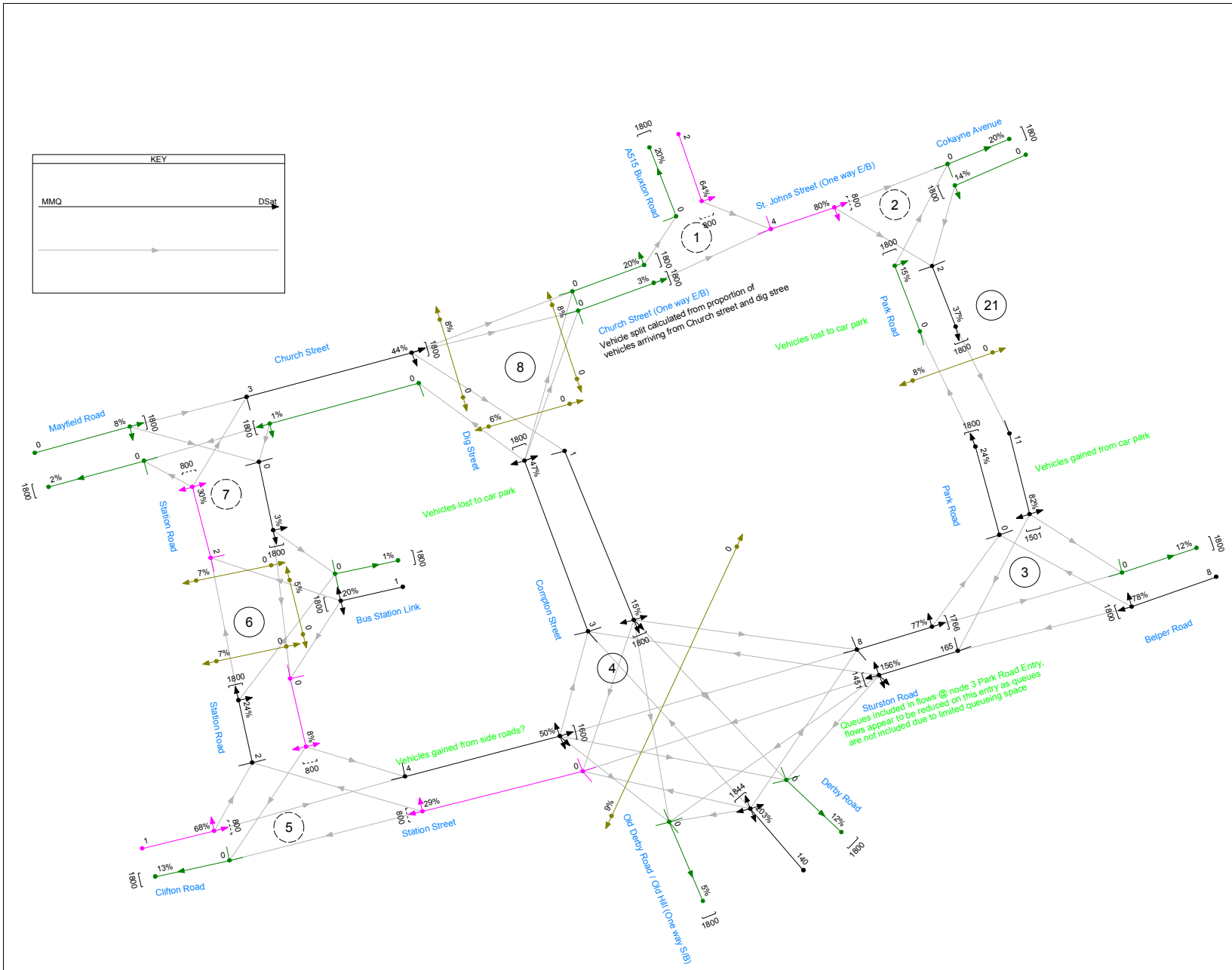


Ashbourne Town Centre - Masterplan Devlopment Flows - Option 2 AM



Ashbourne Town Centre - Masterplan Devlopment Flows - Option 2 PM

Appendix B
TRANSYT Flow Diagrams



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Author	Date	Scale
D. Manning	26 Jun 2008	NTS

Project Title

Ashbourne Base

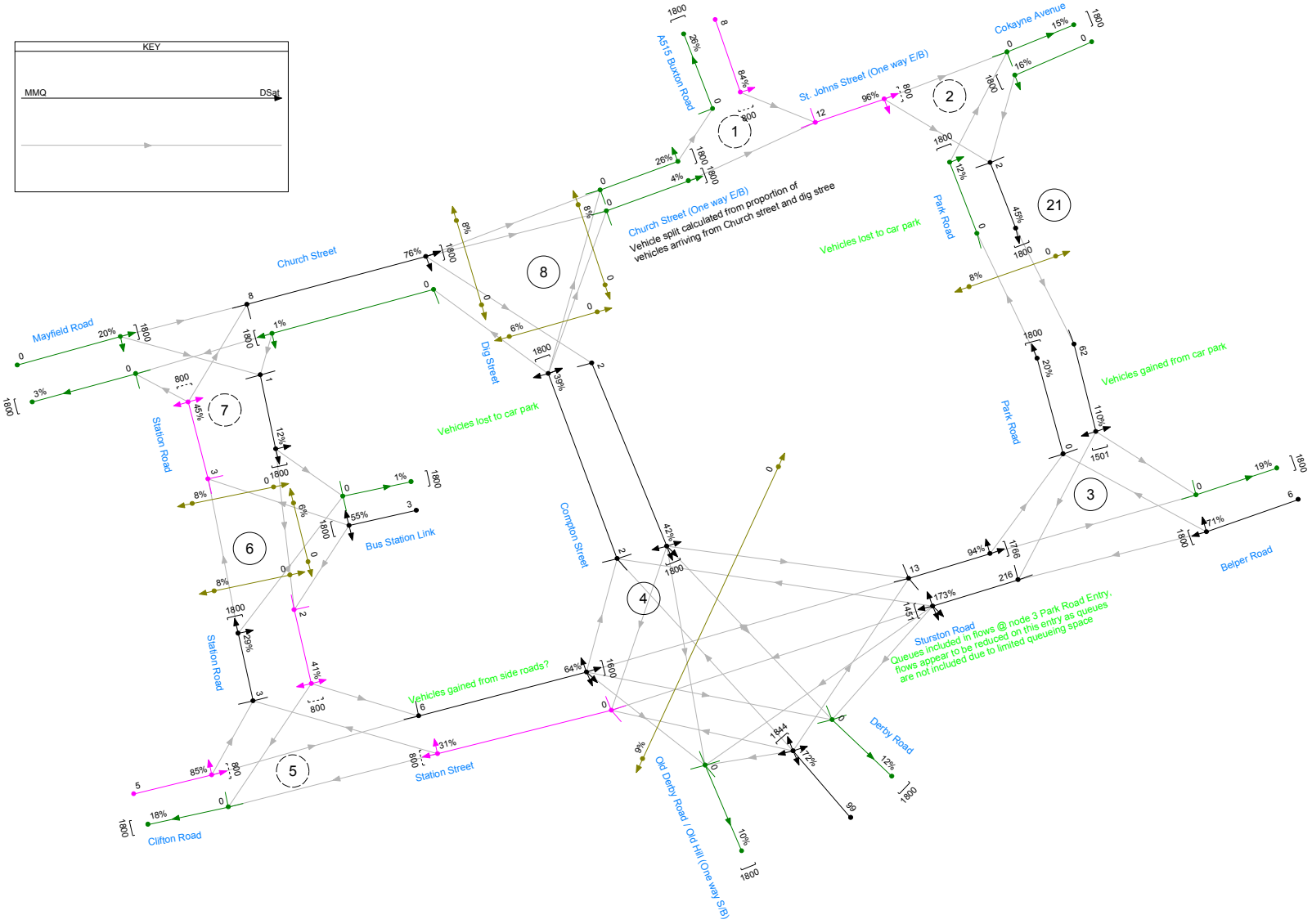
Drawing Title

Flow Group

Base AM 2008 PCU's

FileName

Ashbourne Base.tnd



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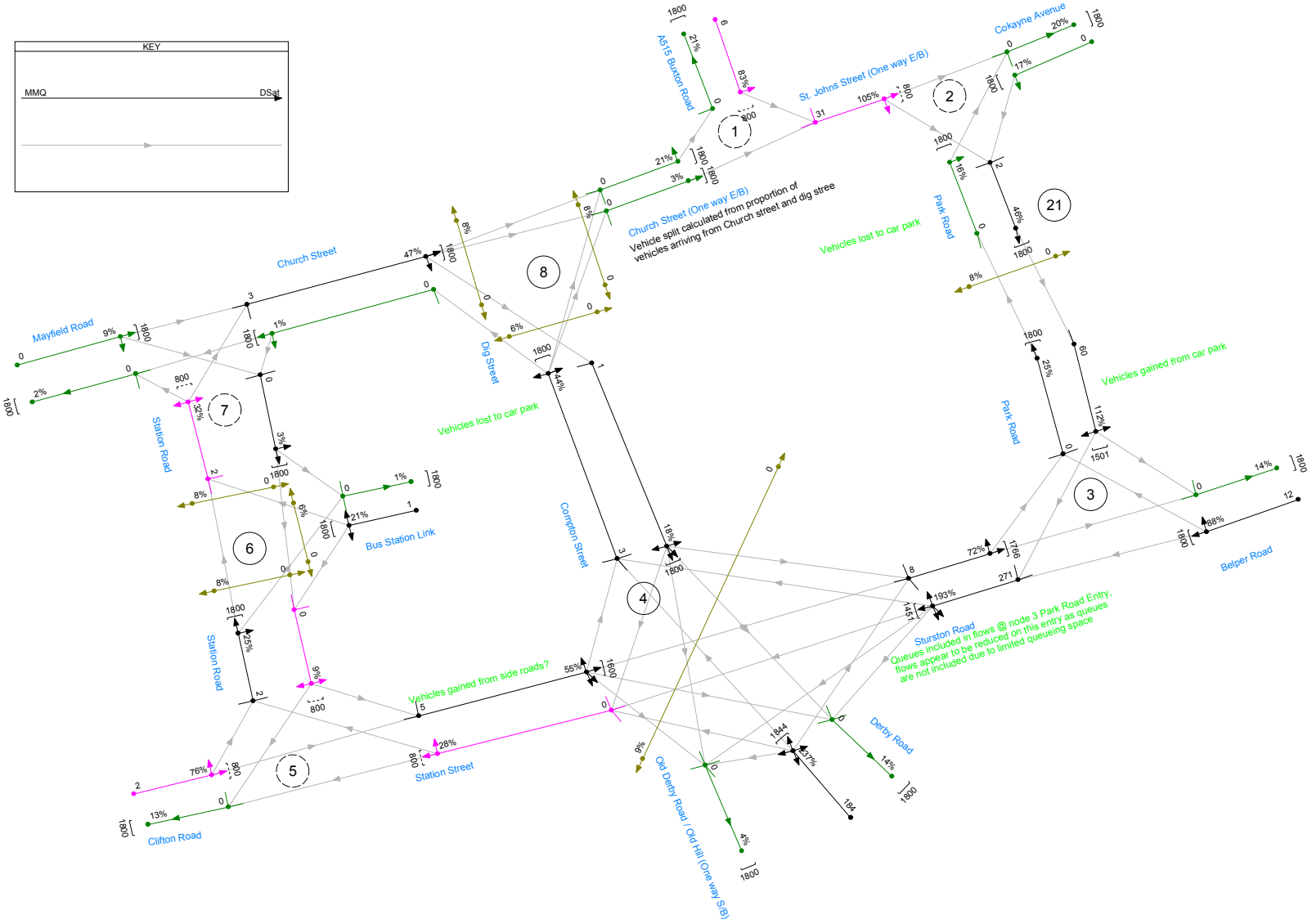

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Drawing Title

Flow Group

Base AM 2008 + Dev Flows

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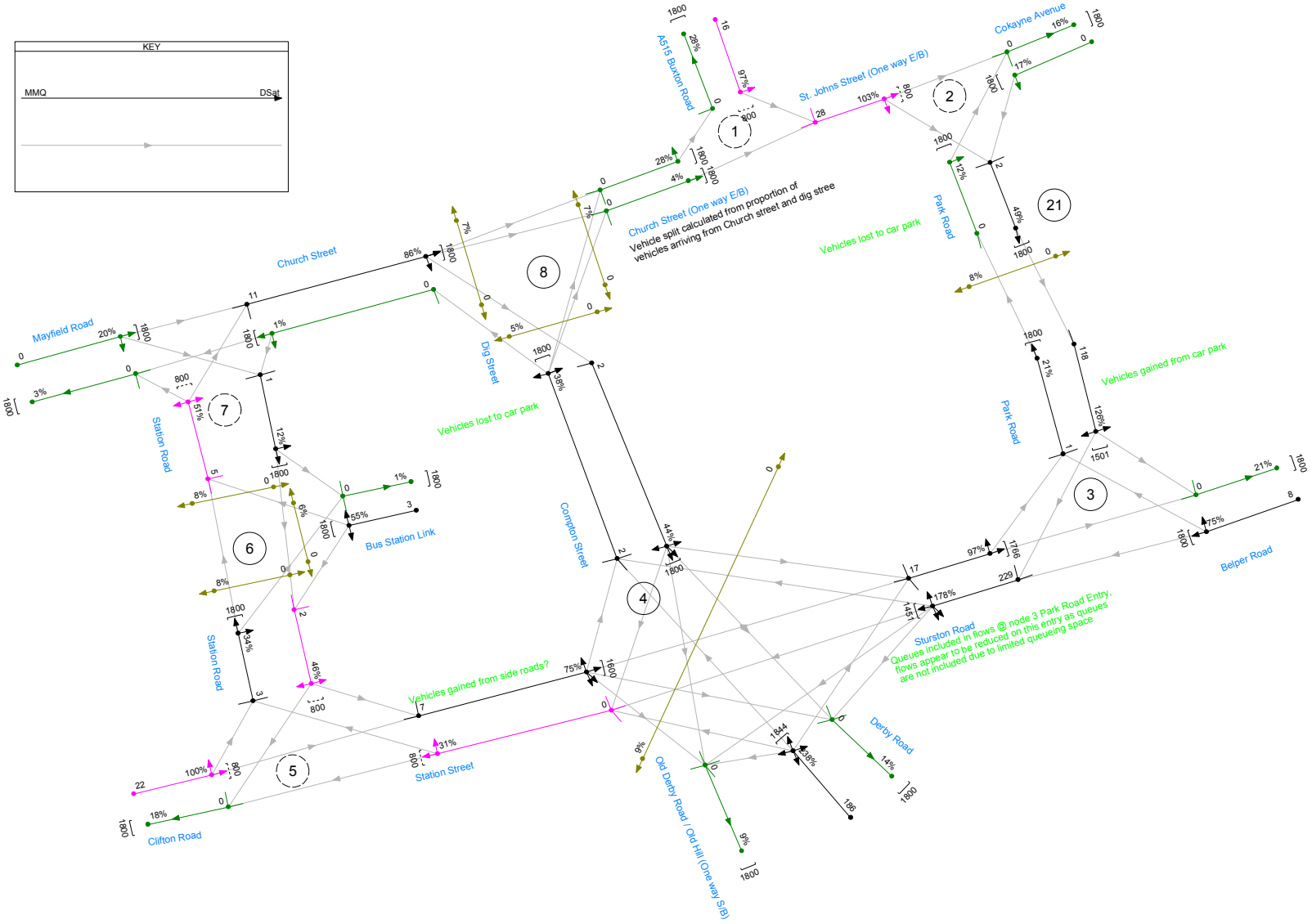

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Scale	NTS
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Drawing Title	
Flow Group	Base PM 2008 + Dev Flows
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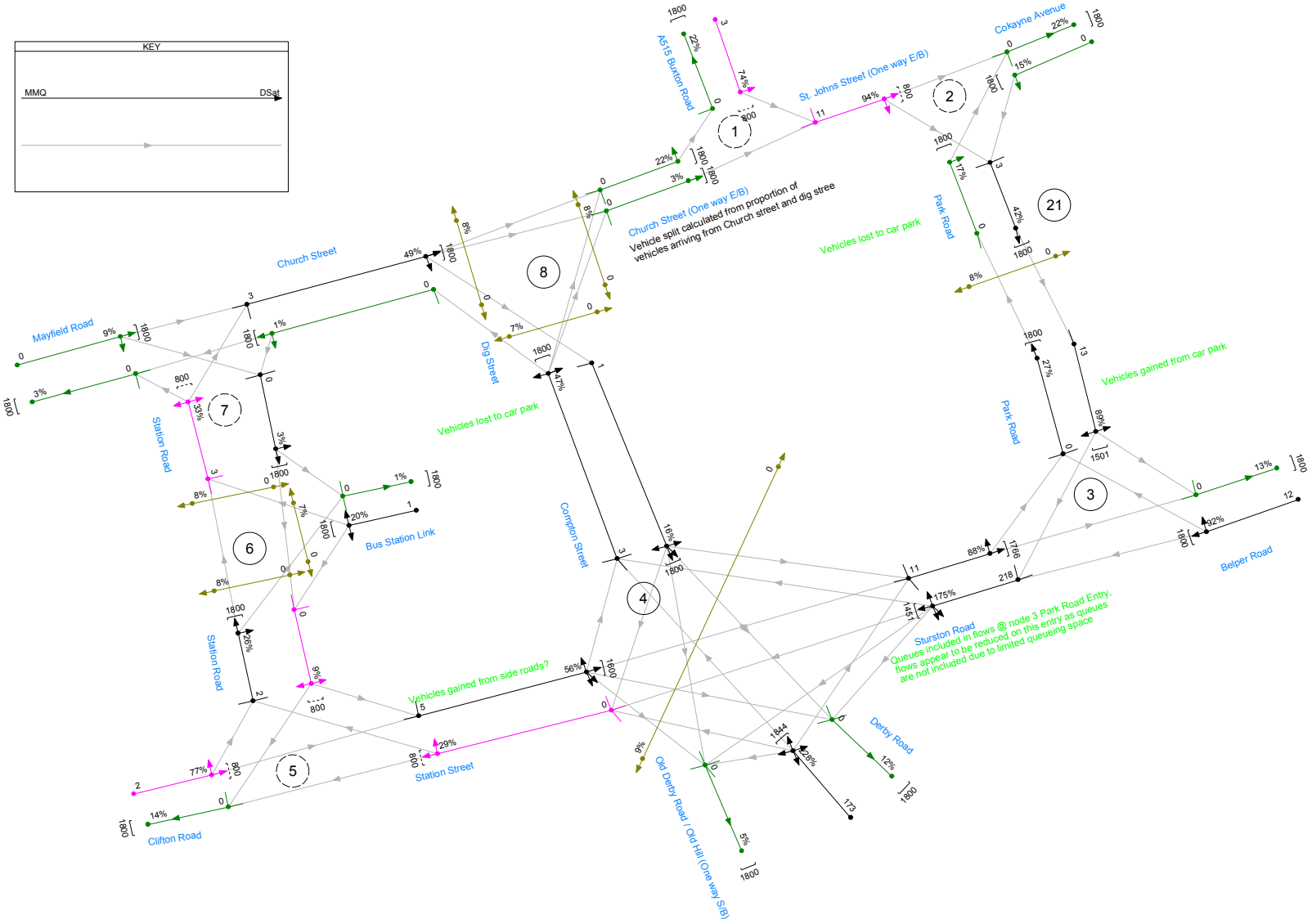

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Project Title

Ashbourne Base

Drawing Title

Flow Group

Summer AM 2008 PCU's

FileName

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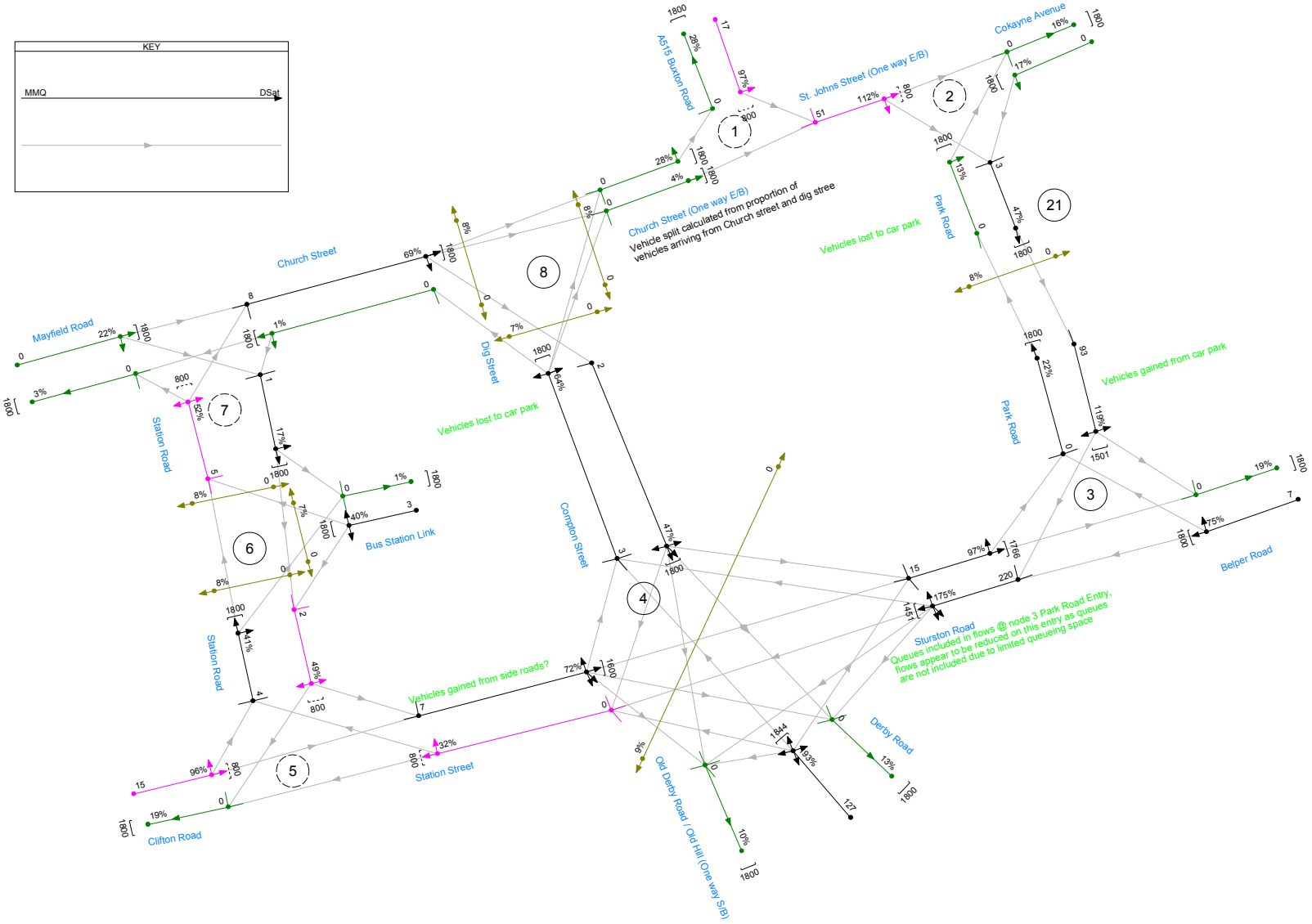

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Author	Date	Scale
D. Manning	26 Jun 2008	NTS

Project Title

Ashbourne Base

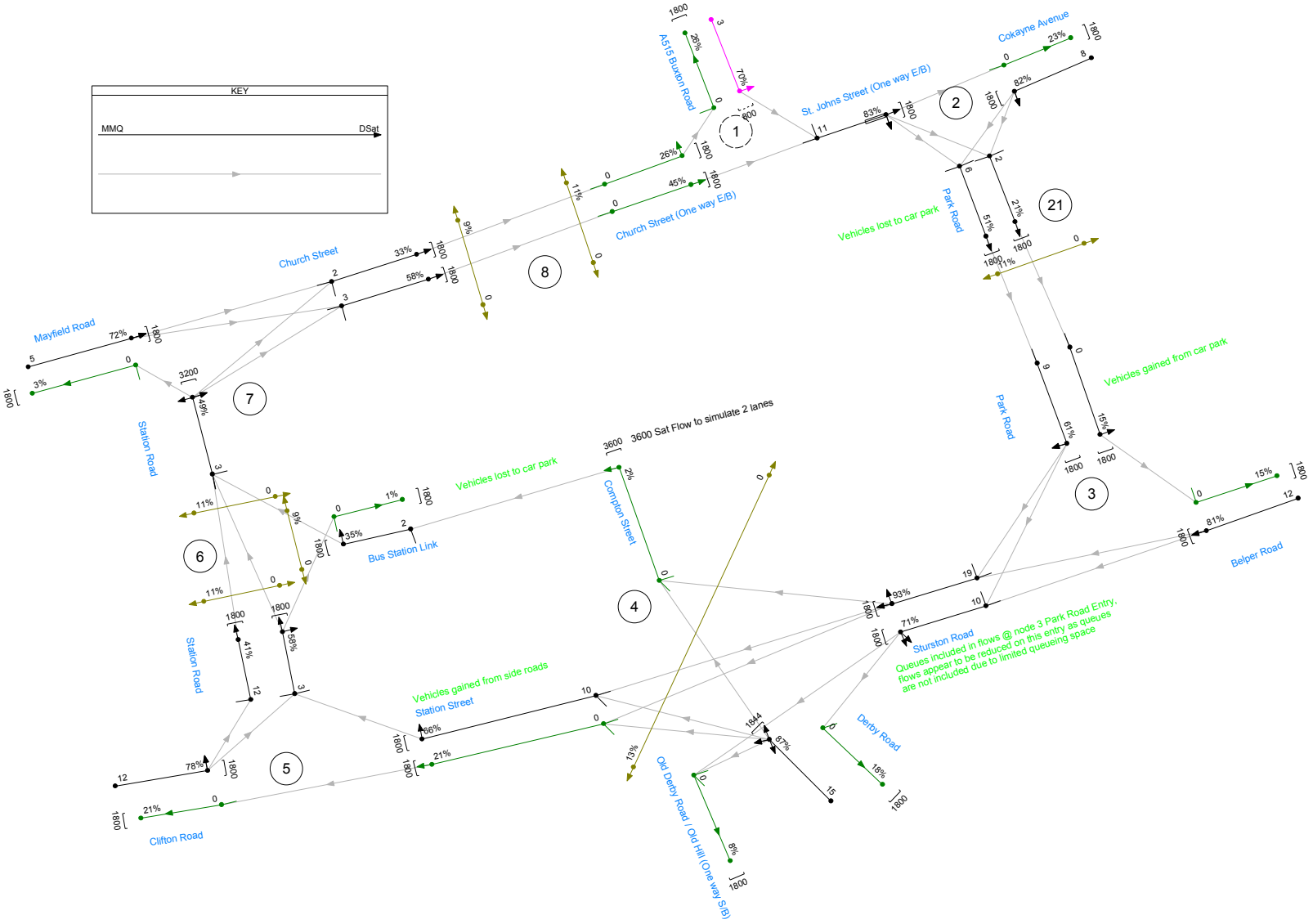
Drawing Title

Flow Group

Summer PM 2008 PCU's

FileName

Ashbourne Base.tnd



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Project Title

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Drawing Title

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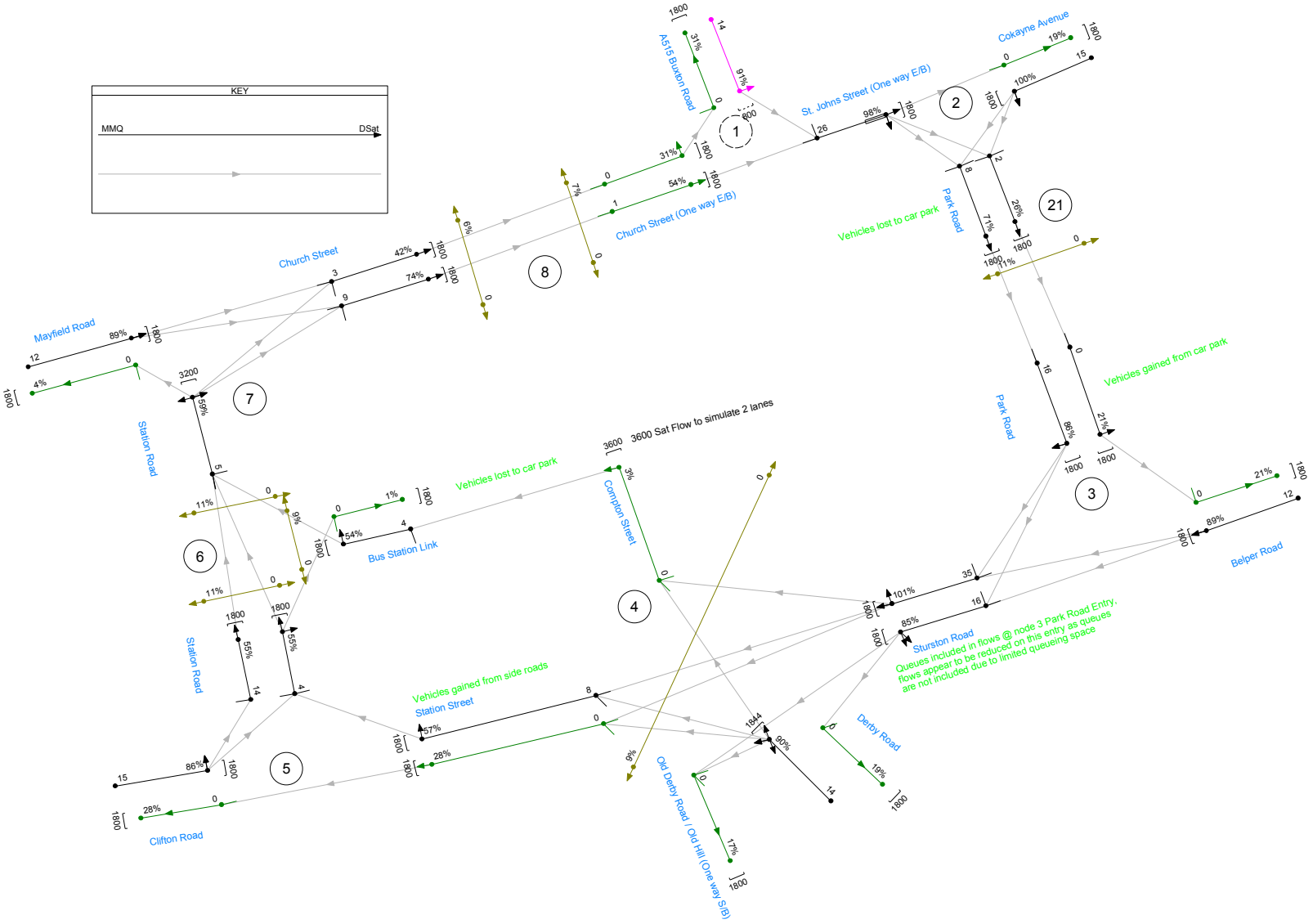
Ashbourne Op1 - Gyratory.tnd



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Scale	NTS
Project Title	Ashbourne Base
Drawing Title	
Flow Group	Op1 PM 2008 PCU's
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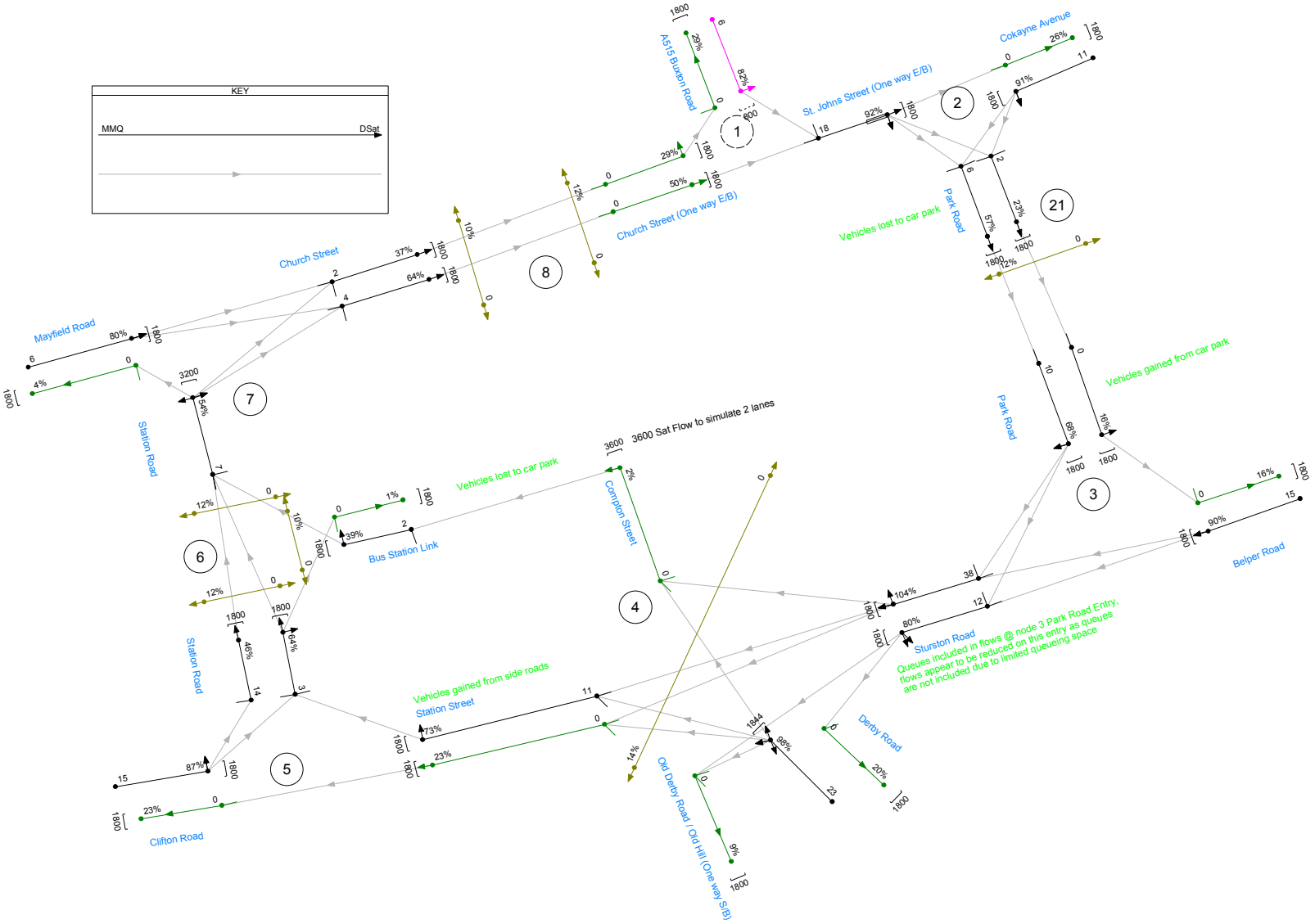

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Project Title

Ashbourne Base

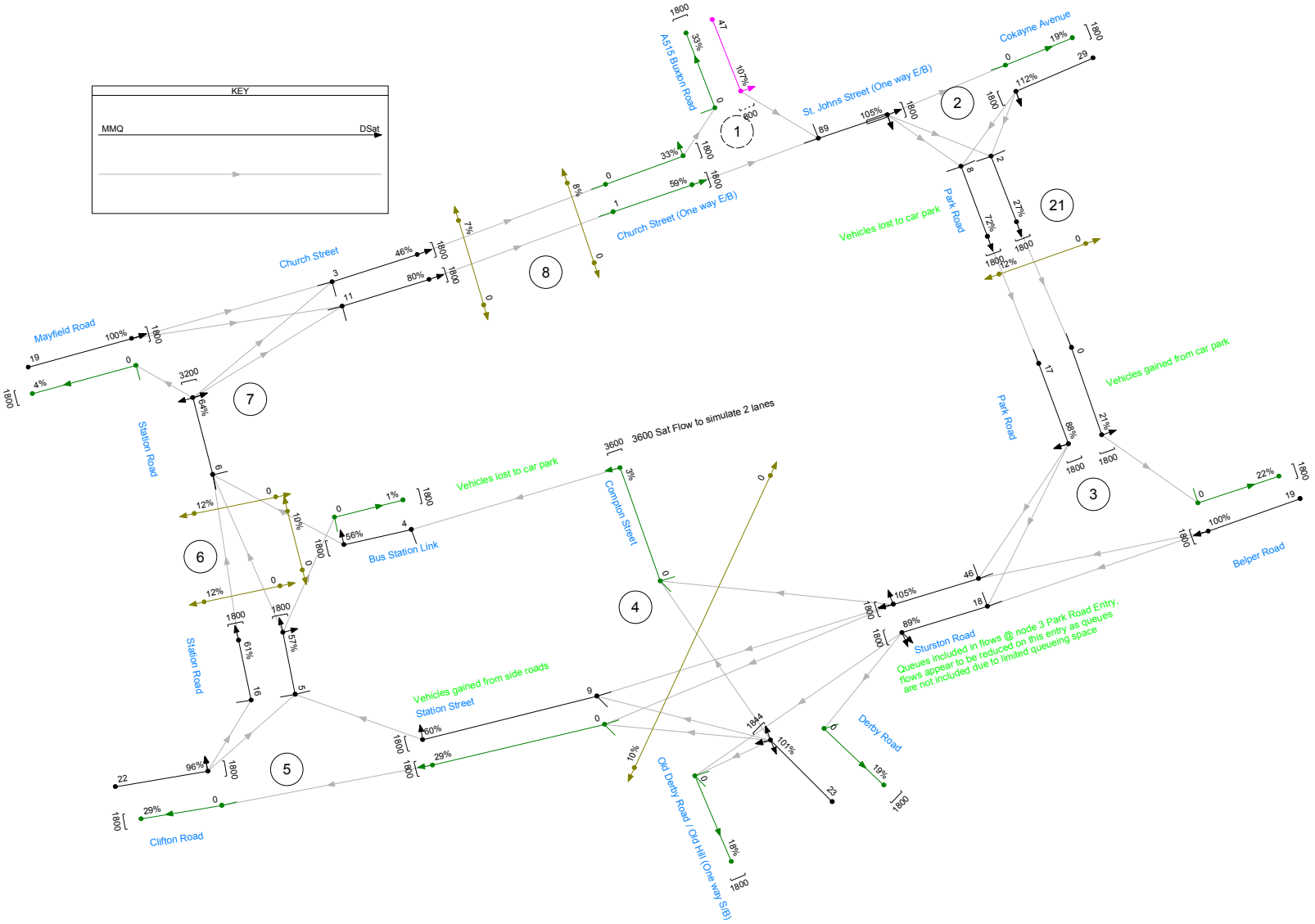
Drawing Title

Flow Group

Op1 AM Summer

FileName

Ashbourne Op1 - Gyratory.tnd



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Project Title

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Drawing Title

Flow Group

Op1 PM Summer

FileName

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Appendix C
Road Safety Analysis

Compton Street / Sturston Road / Derby Road junction – Road Safety Assessment

In the period 1st January 2002 to 31st August 2007, there were ten PIAs at the Compton Street / Sturston Road / Derby Road junction, of which nine were of Slight severity and one of Serious severity. Accident analysis is provided at the end of this Appendix.

A site visit was undertaken 18th March 2008 to observe the operation of the junction in terms of potential conflicts. The junction and approach roads had clearly visible road markings and signal heads.

The right turners from Sturston Road into Compton Street travel forward in the same path as the ahead movement only starting to turn northbound when close to the mouth of Station Street. It therefore requires the Station Street traffic to observe the vehicles indicators to realise it is turning right rather than going ahead.

Vehicles waiting to turn right into Derby Road from Station Street stopped in a variety of positions in the junction some moving slowly forward being unsure whether to pass behind or in front of the oncoming traffic turning right into Compton Street. Vehicles waiting to turn right into Old Hill from Station Street stop in the mouth of Station Street thereby preventing the vehicles behind them being able to proceed.

Vehicles turning into Old Hill from Compton Street wait further south in the junction than they would if turning right into Station Street and thereby placing themselves in the path of the ahead movement from Derby Road to Compton Street.

The left turn from Sturston Road into Derby Road is not signalled and has a Give Way line. HGVs and buses have a larger swept path and if this manoeuvre is undertaken during the Derby Road / Compton Street stage conflicts occur between them and the traffic exiting Derby Road. The Derby Road traffic when faced with such a vehicle has to wait close to the stop line to allow sufficient room to complete the turn and therefore reducing the capacity.

The traffic travelling from Station Street ahead into Sturston Road have their path blocked by vehicles turning right from Sturston Road into Compton Street by positioning themselves too far north. The Station Street ahead movement can only continue once they had given way to the Sturston Road right turners by waving them over to complete the turn.

A number of right turning vehicles that were at the front of the queue when the signals changed from red to green were observed pulling away quickly and moving over the right hand side of the carriageway in order to complete the turn before the Station Street traffic entered the junction.

The vehicles turning right into Sturston Road from Derby Road have a clear line of sight to the Compton Street stop line and when no opposing traffic is seen the traffic moves over to the right hand side of the carriageway before it has even exited Derby Road passing close to the Sturston Road refuge to make a tight right turn. However, frequently when traffic is travelling from Compton Street to Derby Road it has to manoeuvre around a vehicle waiting to turn right into Sturston Road.

As was noted in a preceding section, there is insufficient room to satisfactorily remark the junction to introduce additional guidance to road users. However, it should be noted that the junction has recently been upgraded to MOVA control. As such, a “Do Nothing” scenario may be appropriate in the first instance in which no measures are undertaken and the accident records are monitored to assess whether the introduction of MOVA and the subsequent reconfiguration of the phasing have addressed the road safety problem at this location.

Table 1 - In date order

Compton Road / Sturston Road, Ashbourne. Accident data 1/1/02 to 31/8/07

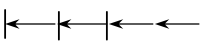
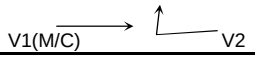
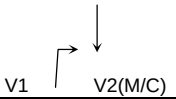
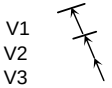
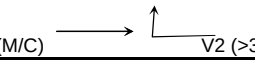
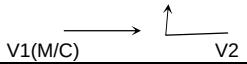
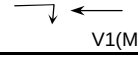
Ref No	Severity	Casualty in (No.)	Veh / Ped	Time	Day	Road Surface	Light / Dark	Contributory Factors	Stick Diagram	
02/141	Sl	V1	Car	10:10	Wed	Dry	Light	V2 Injudicious right turn - Possible		
04/119	Sl	V2 (2) & V3 (1)	Car	10:30	Mon	Dry	Light	Shunt. V3 Careless / Reckless - Possible		
04/285	Sl	V1	Car	15:40	Sat	Dry	Light	V1 Failed to judge speed - Possible		
04/410	Sl	V1(2)	Car	11:20	Fri	Wet	Light	V2 failed to stop & Slippery road - Possible		
04/644	Sl	V1	Car	00:01	Mon	Wet	Dark / St lights	V1 loss of control & travelling too fast - Possible		
05/002	Ser	V1	M/C	14:30	Sat	Wet	Light	V2 Injudicious turn - Very Likely. Slippery Road - Possible		
05/075	Sl	V2	Car	17:35	Tues	Wet	Dark / St lights	Shunt. V3 Travelling too fast and Slippery Road - Very likely		
05/312	Sl	V1	Car	11:25	Wed	Wet	Light	V2 Injudicious right turn - Possible		MOVA installed prior to this accident.
05/466	Sl	V1 & V2	Car	08:51	Mon	Dry	Light	V2 Failed to judge speed - Possible		
06/173	Sl	V1	M/C	14:10	Mon	Dry	Light	V2 Failed to look - Very likely		MOVA reconfigured to add output for queue on Phase G in Loop

Table 2 - In Accident Type Order

Compton Road / Sturston Road, Ashbourne. Accident data 1/1/02 to 31/8/07

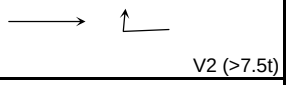
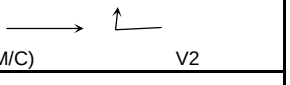
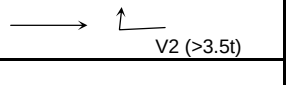
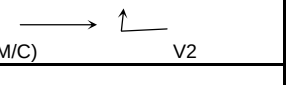
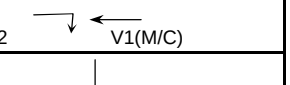
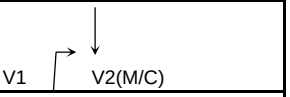
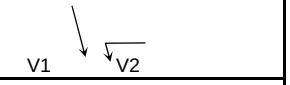
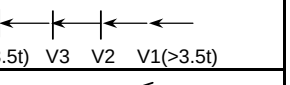
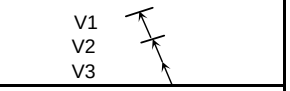
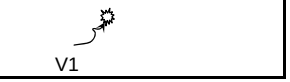
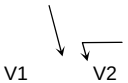
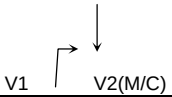
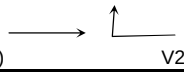
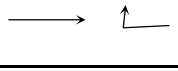
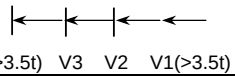
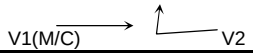
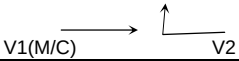
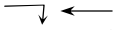
Ref No	Severity	Casualty in (No.)	Veh / Ped	Time	Day	Road Surface	Light / Dark	Contributory Factors	Stick Diagram
02/141	Sl	V1	Car	10:10	Wed	Dry	Light	V2 Injudicious right turn - Possible	
04/285	Sl	V1	Car	15:40	Sat	Dry	Light	V1 Failed to judge speed - Possible	
05/312	Sl	V1	Car	11:25	Wed	Wet	Light	V2 Injudicious right turn - Possible	
05/466	Sl	V1 & V2	Car	08:51	Mon	Dry	Light	V2 Failed to judge speed - Possible	
06/173	Sl	V1	M/C	14:10	Mon	Dry	Light	V2 Failed to look - Very likely	
05/002	Ser	V1	M/C	14:30	Sat	Wet	Light	V2 Injudicious turn - Very Likely. Slippery Road - Possible	
04/410	Sl	V1(two)	Car	11:20	Fri	Wet	Light	V2 failed to stop & Slippery road - Possible	
04/119	Sl	V2 (two) & V3 (one)	Car	10:30	Mon	Dry	Light	Shunt. V3 Careless / Reckless - Possible	
05/075	Sl	V2	Car	17:35	Tues	Wet	Dark / St lights	Shunt. V3 Travelling too fast and Slippery Road - Very likely	
04/644	Sl	V1	Car	00:01	Mon	Wet	Dark / St lights	V1 loss of control & travelling too fast - Possible	

Table 3 - In Road Surface order

Compton Road / Sturston Road, Ashbourne. Accident data 1/1/02 to 31/8/07

Ref No	Severity	Casualty in (No.)	Veh / Ped	Time	Day	Road Surface	Light / Dark	Contributory Factors	Stick Diagram
05/075	Sl	V2	Car	17:35	Tues	Wet	Dark / St lights	Shunt. V3 Travelling too fast and Slippery Road - Very likely	
04/410	Sl	V1(2)	Car	11:20	Fri	Wet	Light	V2 failed to stop & Slippery road - Possible	
05/002	Ser	V1	M/C	14:30	Sat	Wet	Light	V2 Injudicious turn - Very Likely. Slippery Road - Possible	
04/644	Sl	V1	Car	00:01	Mon	Wet	Dark / St lights	V1 loss of control & travelling too fast - Possible	
05/312	Sl	V1	Car	11:25	Wed	Wet	Light	V2 Injudicious right turn - Possible	
02/141	Sl	V1	Car	10:10	Wed	Dry	Light	V2 Injudicious right turn - Possible	
04/119	Sl	V2 (2) & V3 (1)	Car	10:30	Mon	Dry	Light	Shunt. V3 Careless / Reckless - Possible	
04/285	Sl	V1	Car	15:40	Sat	Dry	Light	V1 Failed to judge speed - Possible	
05/466	Sl	V1 & V2	Car	08:51	Mon	Dry	Light	V2 Failed to judge speed - Possible	
06/173	Sl	V1	M/C	14:10	Mon	Dry	Light	V2 Failed to look - Very likely	

Appendix D
Pedestrian Assessment

PERS Assessment

Given its nature as a retail and tourism centre, a basic pedestrian audit has been conducted to consider pedestrian issues along Dig Street and Compton Street only; given that such issues were identified within the scoping study as meriting greater assessment. For this, the *Pedestrian Environment Review System* (PERS) has been used.

A PERS review may be defined as *'a systematic process designed to assess the quality of the pedestrian environment within a framework that promotes objectivity*'. Importantly, a PERS review follows a set framework such that all audits follow the same criteria and therefore receive a standard score.

Six aspects of the pedestrian environment are considered within a PERS appraisal. These are;

Aspect	Component
Links	Effective width, Dropped Kerbs, Gradient, Obstructions, Permeability, Legibility and Lighting.
Routes	Directness, Permeability, Road Safety, Personal Security, Legibility, Rest Points, Quality of the Environment.
Crossings	Legibility for sensory impaired people, Dropped Kerbs, Gradient, Obstructions, Surface Quality, Maintenance.
Public Transport Waiting Area	Information to the waiting area, Infrastructure to the waiting area, Boarding public transport, Information at the waiting area, Safety perceptions.
Public Space	Moving in the space, Interpreting the space, Personal safety, Feeling comfortable, Sense of place, Opportunity for activity.
Interchange	Moving between modes, Identifying where to go, Personal Safety, Feeling Comfortable, Quality of the Environment, Maintenance.

Table 8.x: PERS Assessment Criteria

Link 1: Dig Street West

	Very Poor						Very Good
PERS Score	-3	- 2	-1	0	1	2	3
	Min						Max
Weighted Score	-120	-80	-40	0	40	80	120

Link 1 = -47

Along this link, the footway is narrow in places so that pedestrians pass with difficulty; this is particularly noticeable at the bridge over the river. The width is also narrowed in places by lorries parking on the footway.

Crossing the road is made difficult owing to reduced sightlines (due to a bend in road), lack of dropped kerbs and vehicle flow. Some informal crossing takes place but the only viable crossing point is the pelican crossing C1.

The gradient of the link is mainly level and should not cause difficulty to pedestrians. Also, a bench is provided outside the Coach and Horses pub in case pedestrians need to rest.

Low scores are given for the legibility of the link as only street names and road signs are provided; this may make it unclear where to go.

Legibility for the sensory impaired is poor as the only tactile information and colour contrast is found at C1.

Surface quality on the link varies as, although fairly well laid in general, specific footway defects lower the score. Many potential trip hazards exist especially outside the Coach and Horses pub. Some utility covers are also slippery.

In terms of the quality of the environment the frontages are of a high quality and the street is fairly well presented. Negative impacts stem from traffic pollution, footway defects and grimy surfaces.

Link 2: Dig Street East

	Very Poor						Very Good
PERS Score	-3	- 2	-1	0	1	2	3
	Min						Max
Weighted Score	-120	-80	-40	0	40	80	120

Link 1 = -35

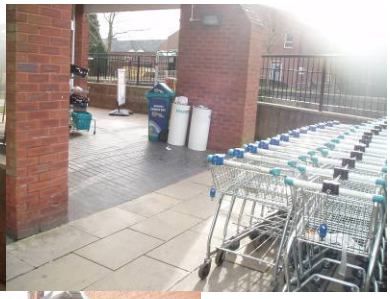
As with Link 1, this footway is narrow to the north end, wide in the middle and has some pinch points; in particular outside Somerfields, close to the bridge. Obstructions on the link also reduce the width of the footway (including scaffolding and parked vehicles).

Dropped kerbs are provided where necessary and most of the link is level. There are, however, steps present by the bridge which may be a hindrance to some pedestrians. The surface quality varies along the link with minor defects in places.

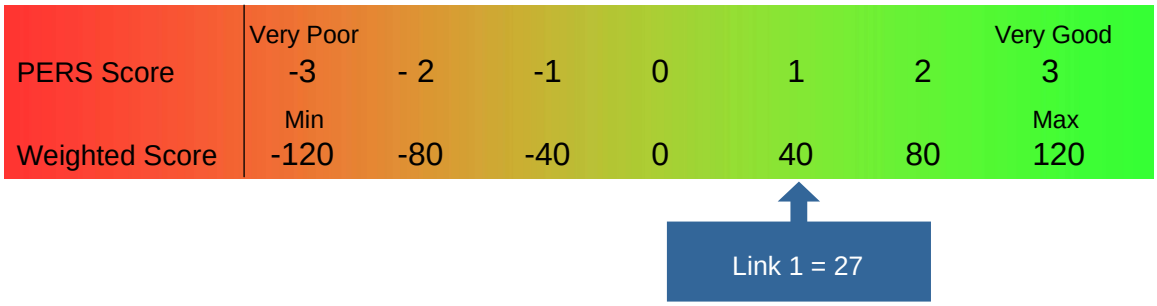
A formal crossing point is provided at C1, though some informal crossing was observed taking place at the bridge where sightlines improve.

Low scores were given for the legibility of the link as only street names and road signs are provided, so that it may be unclear where to go.

Tactile information in colour contrast is provided at C1 but there is none over side streets or to identify obstructions.



Link 3: Compton Street (both sides of road)



For the level of pedestrian flow observed, the footway widths appear to be suitable on this link. There are no obvious obstructions on the link although the movement of vehicles into side roads and premises may be a hindrance.

Dropped kerbs are located over side roads where necessary. Overall the link is generally flat and level with the undulations over side roads. However the only formal rest point is seating at the northern end of the link.

The only formal crossing point is C2 at the southern end of the link which is approximately 200m from the northern end of the link. Informal crossing occurs along Compton Road where possible but sight lines are restricted by parked cars making this somewhat difficult.

Legibility of the area is improved by the provision of high quality signage on the south side of the bridge. Legibility for the sensory impaired is improved by tactile paving provided at crossing points. On the eastern footway the kerbside is delineated by cobbles. Along Compton Street the tonal contrast is infrequent and not provided over the entrance to the petrol station.

The footway surfaces are generally well laid, and are a mixture of flags with some minor defects.

Positive aspects of the street are its historic value, width and perceived calm relative to Dig Street. However, at the time of the survey little soft landscaping was observed. Overall the street is clean and well presented with few signs of litter or neglect.

Crossing 1: Across Dig Street (at junction with St Johns Street)

PERS Score	Very Poor -3	- 2	-1	0	1	2	Very Good 3
Weighted Score	Min -90	-60	-30	0	30	60	Max 90

Crossing 1 = 18

This crossing is over a main road junction and is well used. An all-red pedestrian stage is provided giving priority to pedestrians. However, the crossing is situated just off the main pedestrian desire lines. Site observations indicated that pedestrians generally move from the south to the east or the east to the south at this crossing point (i.e. towards the Market Square).

Capacity at the crossing appears to be suitable for the pedestrian flows observed. Delay occurs as the crossing is fairly wide, with long waiting times between crossing stages.

Legibility for the sensory impaired is in place with suitable audible and tactile information. Colour contrast, however, may be inadequate and there are no rotating cones. Surface markings are also worn and the crossing is poorly illuminated.

The dropped kerbs that are in place are flush and aid crossing. Gradients at the crossing are potentially problematic on the eastern side where there is a crossfall and a ramped access to the bank. This may cause some pedestrians difficulty.

The only potential obstruction noted is a signal column on the east side, although sight lines are also obscured by buildings. Crossing surfaces appear suitable with few defects although there is a slippery utility cover on east side. Despite an absence of litter or debris, the crossing appears dirty and has some stickers and chewing gum attached to infrastructure.

Crossing 2: Across Compton Street (at Junction with Sturston Road)

	Very Poor						Very Good
PERS Score	-3	- 2	-1	0	1	2	3
	Min						Max
Weighted Score	-90	-60	-30	0	30	60	90

Crossing 2 = 3

This signalled crossing is situated at a busy junction, giving pedestrians priority. The crossing serves a desire line east to west. However, pedestrians face a long delay when waiting for the for green man phase followed by a short signal phase. Sightlines are reduced by building lines.

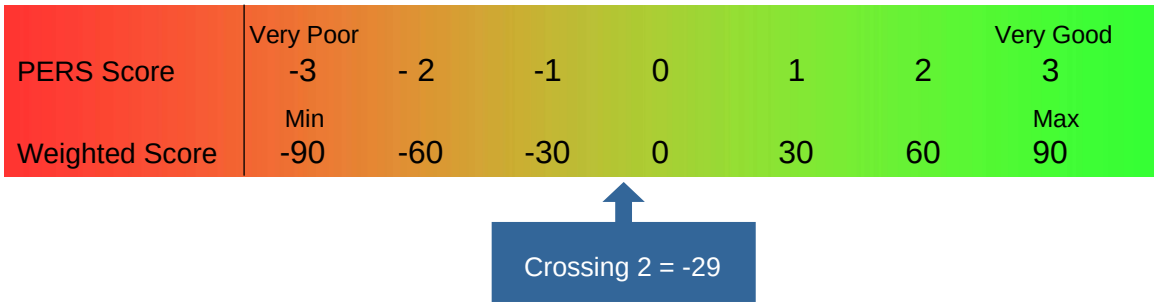
The capacity of the crossing is suitable for the observed pedestrian flows but waiting widths on the west side are minimal.

A lack of delineation is found on the carriageway for pedestrians (although the surface is smooth), reducing the legibility of the crossing. Tactile information is adequate but not installed right to the building line. Further problems include a rotating cone not working on the east side.

Kerbs appear well installed which aids crossing but there is some crossfall from south to north which may hinder movement

Overall the crossing appears fairly well maintained but is dirty and surfaces on approach have many defects.

Crossing 3: Across Park Road at junction with Sturston Road

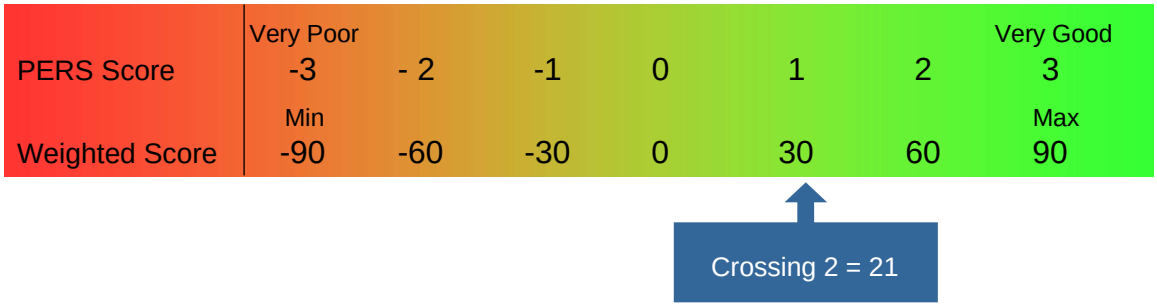


Despite being at a busy junction, the pedestrian crossing facilities comprise dropped kerbs and tactile paving only; no pedestrian signals are provided. It may be difficult to cross here as sightlines are reduced by a hedge and wall and vehicle flows are high. This causes delay in crossing as it is difficult to judge traffic movements; much depends on the ability of the pedestrian to get across during the inter-green period.

Colour contrast of the tactile information is suitable and kerbs are well installed. However, on the west side one kerb stone is cracked creating a gap and making it rock

The gradient of the crossing is almost level and should not cause difficulty. The carriageway surface is smooth with some defects on approach and potential for standing water at the kerbside. Here debris is present in the form of grit/silt.

Crossing 4: Across Park Road (from Shaw Croft car park to park)



This pelican crossing serves a desire line from the park (east) to the town (west) over a moderately trafficked road. Many school children were observed using the crossing.

Some deviation (5-10m) is caused by the positioning of the crossing, with guard-railing further restricting movement. Sightlines are clear and the crossing is operational but traffic was noted to approach the crossing at speed.

The crossing appears to be designed to the minimum capacity which may be unsuitable if there are many pedestrians or wheeled users.

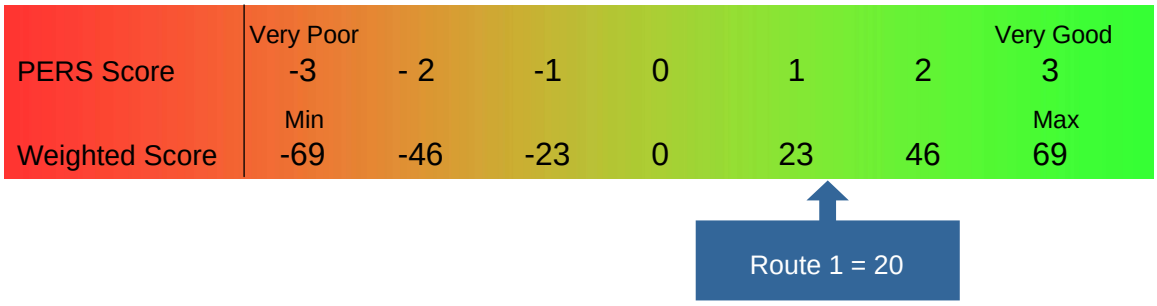
Delay is reduced by a fairly narrow carriageway. However, although the pedestrian phase is appropriate there is a long wait for the signal which may encourage pedestrians to cross between traffic flows.

The legibility of the crossing is improved as it is well lit and appears to be well marked. Tactile information is correct and audible information is present but there are no rotating cones and colour contrast is dirtied / faded

Dropped kerbs are well installed and the gradient of the crossing should not cause users difficulty; although the access ramp may be a little steep on western side

The only obstruction on the crossing is overhanging foliage on west side to north (although no pedestrians were observed using this footway). The carriageway surface is smooth, though there are small defects on approach and potential for standing water at the kerbside.

Route 1: Park Road



This is direct route along Park Road so that there is minimal deviation and wasted journey time. On the route, a formal crossing point is provided to the park (C4) although informal crossing was observed to take place, depending on traffic flows and user ability. Many access/egress points stem from the route which improves permeability.

Wide footways and verges are available. Vehicle movements seem to form platoons so that flows are not constant.

Personal security scores are raised by informal surveillance from other pedestrians, vehicles and properties overlooking the footway.

Legibility of the route is reduced by a lack of signage or way-finding aids. Tactile information and colour contrast is in place where needed but not over the entrance to the Fire Station.

Only one rest point is provided on the route opposite Henmore Place. This seating offers no protection from weather, appears degraded and is unlikely to aid passage on the route.

Aesthetics on the route are positively influenced by nearby parks and the historic town centre. It is the case that frontages on the route are generally pleasant.

PERS Assessment Summary

With regard to the links assessed it was the case that in a number of places delivery vehicles parked on the footway, hindering movement. Notably, passage was restricted on Dig Street.

Legibility is reduced in places by a lack of signage so that it may be more difficult to navigate within the town. This could be particularly important to assist visitors.

At a number of crossings delay is caused by a long wait for the pedestrian phase, which encourages people to cross between traffic.

In particular, the crossing at the junction of Park Road and Sturston Street (C3) is considered to be inadequate for pedestrians; given the reduced sight lines, lack of pedestrian signals and heavy traffic flow. However, it is understood that the addition of a pedestrian phase here may considerably reduce capacity of an already overcapacity junction. As such, a further pedestrian crossing to the south (along Park Road, may be appropriate.

Appendix E
Parking Issues

Parking on Mayfield Road and The Green Road

Mayfield Road

A site visit was undertaken 18th March 2008 to observe the parking on Mayfield Road. As a School Crossing Patrol was present their comments are included below. St Oswald's School has no residential neighbours directly adjacent, but there are residential properties further southwest along Mayfield Road. Directly opposite the school is St Oswald's Church.

When the lay-by outside the Church is full, vehicles were observed to park on the "School Keep Clear" markings on both sides of the road to drop off and collect children from St Oswald's School. The SCPs view of on-coming north-east bound traffic often gets obstructed by tall vehicles parking in the lay by. The parents are allowed to use the nearby Church car park and walk, although this did not appear to be well used at the time of the site visit.

The available all-day parking appears to be a mixture of school staff and commuters who then walk into town.

Due to the presence of trees along the south-east side of Mayfield Road (which prevents vehicle mounting the kerb) and the width of the road, all the vehicles observed parking were on the north-west side. In the morning, twelve cars were observed at 8.40am, twenty seven at 10am and thirty one by 3pm.

The first vehicle parked adjacent to the "School Keep Clear" markings and then each subsequent vehicle parked behind the last one, extending out of town in a south-westerly direction towards the Garage and cottages. Two cars were observed at 8.40am and at 3.30 pm parked in the lay by on the south-east side and other vehicles parked temporarily in front and behind these to drop off or collect school children. The all day parking therefore has the effect of pushing the parking points of those travelling to and from the school further down Mayfield Road - such that some parent / carers drop off and collect children by parking on the "School Keep Clear" markings.

The parking on the north-west side of the road reduces the width of the available carriageway for passing traffic. However, this served to beneficially slow vehicles down in the vicinity of the school, when larger vehicles and HGVs were travelling in the opposite direction. Some of the cars that parked all day in the lay-by were noted to be overhanging the carriageway and footpath. This further reduced the available road width such that only one vehicle at a time could pass these overhanging cars by giving way to one another.

In terms of road markings, there are;

- two school safety zone signs on the approaches to the school with a "max speed 20mph when lights flash" plate included and wig wag lights below which were used and working;
- two school warning triangle signs either side of the school;
- a bus stop bay marking;
- two "School Keep Clear" markings on the north-east side in front of the school entrance and one on the southeast side; and,
- Adjacent to the south-east side "School Keep Clear" marking there is a uncontrolled crossing point with buff tactile paving. As this crossing point is not protected by the "School Keep Clear" marking on the southeast side, it has white thermoplastic lettering with the legend "PATROL" and a reduced size protective entrance marking to highlight its presence.

In the period 1st January 2002 to 31st August 2007, there were two Personal Injury Accidents (PIAs) on Mayfield Road, both of Slight severity. One, a three vehicle rear shunt in the vicinity of the uncontrolled crossing point at 11.30am on a Friday. The other being a two vehicle rear shunt with a location that was not verified involving a HGV at 2.40pm on a Tuesday. As such, none of the accidents recorded are likely to be due to conflict between the school and other road users.

The following options are available to improve car parking on Mayfield Road;

- use the School Travel Plan process to remind parents / carers to park in the Church car park (rather than park on the SKC markings or in the lay-by) with due regard for any coned areas reserved for funerals;
- to ensure the School Crossing Patrol has suitable forward visibility of oncoming traffic, a Prohibition of Waiting Order could be introduced in the lay-by with exemptions for the Church for Funerals and Weddings. This would need appropriate enforcement;
- review the “School Keep Clear” markings to ensure their compliance with the Traffic Signs Directions and General Directions 2002 which would enable the introduction of the Traffic Regulation Order making the SKC markings enforceable;
- to ensure the “School Keep Clear” markings are not abused, consideration should be given to providing a length of carriageway for short term use associated with the school,
- to reduce the number of HGVs using the road, consider either a Weight Restriction (Except for Access) as there is an alternate route available via the A52 and A515; or the use of positive signing of alternative routes.

The above measures would require consultation with the public to ensure that they would address the problems identified without creating new issues.

The Green Road

A site visit was undertaken 18th March 2008 to observe the parking on The Green Road. The entrance to the Queen Elizabeth School has residential properties (all of which have off-street parking) directly opposite its own vehicular and pedestrian entrance and also adjacent to the southwest. Adjacent to the north-east is a Coach Parking facility for use by the school. One residential property on the south side had a sign on its gate requesting that people do not park in front of the drive.

At 8.50am, there were only three cars parked on the south side and these were outside No. 56 and the rear of the Ashbourne Dental Practice adjacent to the "No Waiting at Any Time" restriction. Due to the number of vehicular dropped crossingw for the residential properties, parents / carers were noted to be dropping off children by parking momentarily in the bus stop bay or the mouth of the schools entrance. No difficulties or delays were observed.

At 3.30pm, the three cars observed in the morning were still present and a further six cars were parked on the south side. Whilst three of these were parked on the extended protective entrance marking which runs the length of five houses, they weren't across any drives. A continuous, steady stream of parents / carers, who stayed in their vehicles, parked on all the available spaces between driveways on the south side until 3.40pm. After this time, the vehicles began parking in the bus stop bay, the "No Waiting At Any Time" restriction and across residential drives until the school children came out at 3.55pm. Two of the cars that had been parked all day were noted to be driven away by older pupils.

No significant delays were observed during the morning period. However, in the afternoon, with the increased number and staggered nature of the parking near the school and the all day parking further towards King Street, it was difficult for traffic to pass without delays. The use of the road in both directions by at least eight school coaches caused considerable congestion as they struggled to pass each other and parked cars. The parked vehicles on the "No Waiting At Any Time" adversely affected the visibility of vehicles turning out of Cokayne Avenue into The Green Road.

There are;

- two School Safety Zone signs on the approaches to the school with a "max speed 20mph when lights flash" panel included and wig wag lights below which did not operate at the start or finish of the school day;
- two School warning triangle signs either side of the school;
- a "School Bus" bay marking across the vehicular entrance to house no.47.
- a "No Waiting At Any Time" is in force in The Green Road from a point approximately 25 metres southwest of it junction with Cokayne Avenue, continuing around this junction into Cokayne Avenue in a southerly direction for an approximate distance of 15 metres.
- in the Green Road, there is a zebra crossing on the north eastern side of its junction with Cokayne Avenue.
- a protective entrance marking on the south side across the vehicular entrances to house nos. 40 to 50 (an approximate length of 56 metres).

In the period 1st January 2002 to 31st August 2007, there were three PIAs on The Green Road all of Slight severity. One rear shunt involved two motorcycles travelling south west with the first vehicle having stopped at the terminal point of the "No Waiting At Any Time" at 2.35pm on a Friday. The second rear shunt lead to the injury of a passenger on the first of two buses / coaches travelling north east with the first bus having stopped at the junction with Spalden Avenue at 3.45pm on a Friday. The third was a head on collision of two cars whilst overtaking a vehicle that had parked directly northeast of the School Bus Bay next to the school entrance at 2.45pm on a Thursday. As such, two accidents may be associated with conflicts between school parking and other traffic flow.

The following options are available to improve car parking on The Green Road;

- Use the School Travel Plan process to remind parents / carers not to park on the “No Waiting At Any Time”, protective entrance marking or in the School bus bay;
- To ensure the vehicles exiting Cokayne Avenue have suitable visibility at the junction with The Green Road, request that Derbyshire Constabulary undertake enforcement of the “No Waiting At Any Time” restriction;
- To ensure the residential property no.47 can access its driveway, consider (1) moving the School Bus Bay 10 metres west to ensure visibility of pupils crossing the carriageway and (2) consider introducing a “School Keep Clear” marking starting directly east of the relocated School Bus Bay across the school entrance compliant with the Traffic Signs Directions and General Directions 2002, to enable the introduction of the Traffic Regulation Order thereby making it enforceable;
- To ensure that parents / carers do not relocate and park on the north side of The Green Road at its junction with Cokayne Avenue thereby adversely affecting the visibility at the junction and pedestrians using the zebra crossing, consider introduction of “No Waiting At Any Time” between the “School Keep Clear” marking and the zig zag markings. These would require enforcement.

The above measures would require consultation with the public to ensure that they would address the problems identified without creating new issues.

Appendix V
Ashbourne Bypass Study, 2010

Ashbourne Bypass Engineering Feasibility Study

March 2010

Derbyshire County Council Scheme Number

Scott Wilson Works Number **D130439**

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Revision Schedule

Ashbourne Bypass Engineering Feasibility Study

March 2010

Rev	Date	Details	Prepared by	Reviewed by	Approved by
0	March 2010	Issue	**Naba Adhikari** Senior Engineer	**Edward Varley** Principal Engineer	**Edward Varley** Principal Engineer

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1 Introduction

This report has been prepared by Scott Wilson Ltd. on behalf of Derbyshire County Council (DCC) under the Three Counties Alliance Partnership framework contract to investigate a bypass route linking the A52 with the A515 on the western outskirts of the Ashbourne, Derbyshire.

The streets in the centre of the town are quite narrow and suffer greatly from congestion caused both by heavy lorries and tourist traffic. Hence, the Derbyshire County Council has asked Scott Wilson to investigate an alternative route or routes on the western side of the town to divert through traffic from the town centre creating a safer and healthier environment for the local people and visitors.

The main purpose of this feasibility study is to investigate possible bypass routes and advise DCC on the most feasible routes for further detailed engineering design. The site is located on the southern gateway to the Peak District National Park, and lies on sandstone and the sandstone & conglomerate interbedded strata along an existing valley. The routes run from A52 Mayfield Road to the A515 Buxton Road, over terraced pasture and grazing farmland with gentle slope of between 5 to 12%.

Based on the site visit and desk study a number of possible by-pass alignments have been examined and most viable one has been considered for further investigation. All routes provide an access from the A52 Mayfield Road to A515 Buxton Road bypassing narrow and congested road sections in the town centre. The alignments are also within the indicated corridor as described in the project brief provided by DCC.

1.1 Desired Output

It is accepted that information to enable a preliminary design to be undertaken is limited at present, and that this report shall form part of a more detailed study and route assessment. This report is therefore intended to provide guidance on the selection of possible routes, and to highlight potential areas where further consideration may be required in the detailed design.

Following completion of the study it is intended that a report detailing the following shall be provided.

- The method of design adopted for the preliminary design of the Bypass Route
- An estimate of the possible construction cost for the works based upon similar works in the area.
- Identify constraints likely to be encountered by a potential route, or routes and describe the scale of mitigation required to address the concerns.
- Review the topography indicated within the shaded area against the Design Manual for Roads and Bridges TD 9/93 Highway Link Design against horizontal and vertical constraints.
- Provide revised corridors consistent with TD 9/93, assuming a design speed of 85 KpH, carriageways width of 7.3 metres wide with a 2.40 metres wide footway/cycleway to one side. No lighting would be required.
- Identify any works related to the retention or diversion of side roads or public footpaths, or any other constraint.
- Identify below ground constraints likely to be encountered by each of the potential routes. Describe where appropriate the scale of mitigation required to address the concerns. For example, are there any geological constraints entailing undue risks that need to be specified, together with likely engineering requirements such as piling, or other ground treatments.
- Undertake a preliminary desk study of the areas geology, providing where appropriate advice regarding likely scope to any mitigation works.
- A provisional AutoCAD drawing of horizontal alignment, typical cross sections and basic junction layouts.
- Describe the earthworks and structures likely to be required.
- Record impacts of each alignment.
- On the basis of the above, provide a preliminary estimate of the likely total cost of delivering each route option.

2 Existing Road Network

The study starts from the Mayfield Road roundabout on A52, to the south of Ashbourne town. There is a three arm roundabout forming a junction between the Mayfield Road and A52 at this location. The roundabout is also the southern limit of the current Ashbourne bypass. The roundabout has an inscribed circle diameter of approximately 21m. Over this section, A52 is a single carriageway with footpath on one side. It has a speed limit of 40mph and width varies from 6.8 m to 9m.

The adjacent land use to the north and south of the A52 is predominantly farmland. Just to the north of the roundabout there is a dead end road called Waterley Lane leading to the waste water treatment plant.

To the northeast of the study area, the A515 runs in a north south direction through Ashbourne town centre forming blind junction with B5035. This section of the A515 Buxton Road through town centre is a substandard road. The existing vertical and horizontal alignments have not been analysed, but by inspection, the vertical alignment would appear not to comply with current design standards. The gradient from the visual inspection show a long fall of 15% at the corner by the junction with Windmill Lane and North Avenue. The alignment would also appear to contain a number of substandard vertical and horizontal curves. The combination of the horizontal and vertical alignments leads to the existing stopping sight distance being heavily restricted. For 50kph TD9/93 requires a desirable minimum stopping sight distance of 70m, which can be relaxed to 50m (one step below desirable) away from junction or access. In this case the existing highway cannot meet current standards, even if they were relaxed. By inspection the route reveals that these stopping sight distances are not achieved at a number of locations along this section of A515. As a result, a by-pass route that would avoid this road section in the town centre would appear to be essential.

The land adjacent to the road on the north of its junction with B5035, north of the town centre is mainly agricultural, whereas on the south the road is bordered mainly by residential properties.

Before joining the A515 Buxton Road to the north the study area under consideration crosses Mapleton Road. This is a single carriageway road with 5.5 m width and 30mph speed limit. This is the route leading to Mapleton village from town centre.

3 Route Development

3.1 General Background

The brief from Derbyshire County Council suggested that the proposed bypass would be an outer western route between the A52 southwest of the town and the A515 to its north. The client has instructed Scott Wilson Ltd to consider only single carriageway by-pass routes for the Engineering Feasibility Study.

3.2 Route 1

For this option, a new roundabout would be provided on the A52 approximately 200 m west of the existing Mayfield Road roundabout. It is currently envisaged that this roundabout would be a three-arm roundabout with the similar size and layout as the existing Mayfield Road roundabout. For this provision a new roundabout will be provided approximately 200m along the A52 from the existing roundabout. The design period and forecast of traffic growth should be subject to the requirements of the Derbyshire County Council and local transport policies. Once a preliminary design has been produced, capacity and delays can be predicted for this roundabout using suitable computer software, which incorporates models developed from the relationships in TRL Report 281. However, the final decision should be taken based on the traffic modelling of the proposed roundabout.

Route 1 commences at the proposed by-pass roundabout on the A52 as described above ends at the proposed new junction on the A515. The entire route runs in a north-westerly to north-easterly direction, predominantly through open farmland. In the beginning, from chainage 00 to 150 route passes across the rear boundary of the sewerage treatment plant in a north-westerly direction and then continue through open farmland up to the end of the route in a north-easterly direction. At chainage, 1650 alignment crosses abandoned railway embankment now used as the Tissington Trail. It is envisaged that the route would pass beneath the trail using a large box culvert system rather than a bridge. This would allow larger verges to be provided to the Tissington Trail to aid the retention of the existing vista. This route will join A515 with a new proposed junction just south of its existing junction with Spend Lane on A515, which is also the northern limit of the study.

The proposed alignment leaves the proposed roundabout with a short section of straight, running in a north-westerly direction. There is then a right hand bend with a 339m radius. This bend runs to approximately chainage 550. The horizontal alignment then consists of a long straight section to chainage 1450, followed by a left hand bend with a radius of 943m. Finally, there is straight running section again from chainage 1800 to 2800, on the approach to the proposed junction at A515.

This section of the alignment has been designed for a design speed of 70kph, which is suitable for a speed limit of 40mph. According to TD9/93 Table 3, minimum radius of horizontal curve for this design speed (one step below desirable minimum) should be 255m with 7% superelevation, which would be satisfied by the proposed horizontal curve of 339m radius at this location.

The current speed limit for the A52 at this location has also 40mph speed limit. Hence, it is considered that a 40 mph speed limit would be appropriate from chainage 00 to 550 section of the alignment. The design speed for the proposed alignment increases after this point to 85kph, which satisfies the horizontal radius of proposed alignment for the remaining section of the route.

The vertical alignment initially consists of a gentle down hill gradient of 0.5% for approximately 700m from the proposed roundabout. The gradient then changes to uphill slope of about 0.75% until chainage 1700. There is then a K20 sag curve followed by another K55 crest. The K55 crest curve is required to lower the alignment for crossing abandoned railway embankment. The alignment has been kept down under the railway embankment to provide adequate head room for this proposed route.

A new junction would be provided at crossing point with Mapleton Road. It is currently envisaged that this junction would be a ghost island junction. However, this junction choice would need to be carefully considered during the detailed design process, as it may need to be upgraded to a signalised junction. The access to the new bypass will be restricted to the left-hand side only and the right-hand side of the Mapleton Road will have no access to the new bypass road.

The vertical alignment leaves the railway embankment on an uphill gradient of 1% at chainage 1700 to 2800 with a K20 sag curve. At chainage 2800, this route connects A515 at proposed new junction.

A new signalised junction has been considered at the end of the route on A515, just south of its junction with Spend Lane as shown on drawing no: D130439/Junction. Another option has also been considered for this point. In this option the lay out of the junction has been considered in such a way that the traffic flow to and from town centre is discouraged. As a result, it is believed that most of the traffic will prefer to follow proposed bypass route resulting in reducing congestion on and around the town centre. A preliminary junction layout is shown on drawing no: D130439/J1. Introducing a junction and a new by pass route may lead to the reassignment of traffic to and from other routes. There is therefore a need to assess the surrounding network for the traffic and safety implications of introducing a new junction.

Without a topographical survey, it will be impossible to provide an accurate earthworks design or quantities for this widening works. We shall provide a best estimate of the factors affecting the vertical alignment based upon the available information and upon visual survey. It is recommended that a more detailed geotechnical survey to determine the exact nature of the ground conditions is undertaken when the final alignment for this route and layout of the junction is agreed.

It has not been determined how private properties fronting the proposed corridor would access the new route. In order to improve the safety and efficiency of the route it would be necessary to control the number of accesses. This may result in the closing of existing access and provision of a parallel access road with a single point of access.

It is currently envisaged that the proposed alignment cross section will comply with TD27/05 requirements for a rural single carriageway all-purpose road (S2). From chainage 00 to 1700, the proposed route is in a low embankment and from chainage 1700 in a shallow cutting before

joining to A515 at proposed roundabout. The typical cross sections and their elements are shown in drawing no;D130439/CS.

This route could accommodate overtaking sections. The route would allow the most efficient movement of through traffic. The corridor is sufficiently far enough away from the main areas of residential properties to provide significant benefits in terms of noise and air quality.

3.3 Route 2

Route 2 was developed in response to a problem identified for Route 1 during the site visit. to avoid the culvert crossing of the Tissington Trail. In fact, Route 2 follows the Route 1 from chainage 00 to 1200 and from chainage 1200, it follows new alignment crossing just north to the existing car park to chainage 2150 at new proposed junction on A515. The terrain for this option is also same within this section. It means the vertical alignment also remains same. For details, refer to Route 1 above.

However, this route connects to A515 at proposed new junction approximately 500m south of the proposed junction for Route 1.This junction will also have similar layouts and characteristic as for Route 1 junction, described in previous section.

The Route 2 alignment leaves Route 1 alignment at chainage 1200 with a horizontal curve of 959m radius, running in a north-easterly direction. The route then crosses the existing Mapleton Road at chainage 1550 close to the farm access road. It then passes to the north of the existing Tissington Trial car park at grade. This route would separate the Tissington Trail from the adjacent tunnel, and would require specific facilities for the cycle route to cross the new alignment at this point. The bypass route then curves back to join A515 with a left-hand curve of 554m radius. All these horizontal curves comply with the requirements of TD9/93 for minimum desirable curve radius and stopping sight distance.

In terms of the vertical profile, the route gently slopes upwards from southeast to northeast. After a shallow cutting the alignment leads into a slight upwards gradient of 1% to meet proposed junction at A515.

3.4 Route 3

Once again, the starting point of the route is same as the Route 1 and 2 at the A52. In order to reduce the route length this option was explored as an alternative to the Route 2. This route follows the Rote 2 alignment up to chainage 650. After this point, alignment cuts off in a north-easterly direction. The alignment continues to travel towards north to cross Mapleton Road at around chainage 1700 and joins A515 at about 200m north of its junction with North Avenue/ Windmill Lane.

This section of the alignment is bordered mainly by farm land up to the backside of the St. Oswald Hospital at chainage 1250 and then the alignment runs close to the residential properties to the east and farm land to the west.

Leaving Route 2 at chainage 650, Route 3 runs in a straight section for about 800m. It then goes through a slight left-hand bend radius of 500m followed by another straight section to join

A515. The proposed junction and its layout at the end of this alignment will be same as for Route 2.

The preliminary lay out of the proposed junction is shown in Junction drawing

After chainage 650, the vertical alignment of this route is changed significantly. In contrast to Route 2 it rises steeply at a gradient of approximately 9% up to chainage 1050. So the vertical alignment initially consists of an uphill gradient of approximately 9% for a length of 800m with a K20 sag curve followed by a K20 crest curve at around chainage1200. The alignment rises to a high point at approximately chainage 1000. The vertical alignment then followed in a gentle slope of 1% along the ridge before crossing Mapleton Road at chainage 1700. At this point the alignment crosses the Mapleton Road with a low embankment as described in Route 2. This section of the alignment then ends with another K20 crest curve before joining A515 at new junction. It is noted that, the vertical alignment between chainage 650 to 1050 does not satisfy the maximum gradient requirements set out in TD9/93.

The proposed junction lay out and its features to tie-in to A515 remain same as for Route 2. For detail, refer to Route 2 &1.

The main benefit of this route is that it mirrors a natural step in the valley side, and would be able to use an existing hedge line to mask the route from the valley floor.

3.5 Route 4

Initially this route was also believed to be an option during the desk study. From the site visit on 2nd March 2010, it appeared that the alignment rises in a steep gradient from south to north for a considerable length. Particularly, from chainage 250, the road starts to climb, reaching a maximum gradient of about 12%. Due to the length of this incline (about 600 metres) a climbing lane for heavy vehicles would be essential. The first section of this gradient would be on a low embankment, but as the route climbs up the hill, it starts to move into cut, reaching a maximum depth of about 6m where it cuts the escarpment face. As a result, it does not comply with the requirements of maximum allowable gradient set out in TD9/93.

As this route continues further north to chainage 1450, some properties across this alignment would need to be demolished. Moreover from chainage 950 onwards the most of the section of this alignment passes across the back gardens of residential properties.

In addition, this route passes in a close proximity to the sewerage treatment plant and cemetery in the beginning of the alignment.

The proximity of this route to the sewerage treatment plant and cemetery meant construction would likely to cause significant disruption to these facilities and may incur considerable costs for the necessary permanent works. Managing the impact of the route on these facilities significantly limited the options available for both vertical and horizontal alignments.

Based on the above site constraints this route has not been considered further as an option of the bypass route.

3.6 Route 5

Route 5 closely follows the alignment of Route 4 from chainage 00 to 1100. The difference between these two routes is only at the crossing point at Mapleton Road at chainage 1500, where the route 4 crosses through a low embankment north to the car park, whereas Route 1 crosses through residential properties over the Mapleton Road.

The analysis made for Route 4 above are also valid for Route 5, hence on the same principal as Route 4, this route has also been dropped and not been considered for further assessment.

4 Standards and Departures from Standard

4.1 General Background

The proposed alignments have been designed in accordance to the TD9/93 of the Design Manual for Roads and Bridges. Cross sections of the proposed alignments have been based on TD27/05. Where allowance has been made for ghost island junctions, these have been designed in accordance with TD42/95. Any roundabout on the scheme would have to be designed to TD16/93.

The proposed bypass routes do not require any departures from standard for the currently proposed alignments. They have utilised the permitted relaxations in some places. The alignments comply with the recommendation of TD9/93, for ;

- Provision of overtaking sections
- Provision of one step below desirable visibility in none overtaking section

TD9/93 recommends that 30% of the proposed road should be overtaking sections (Category 2 road, Table 7). This requirement has been achieved on proposed routes.

The full overtaking sight distance for a design speed of 85kph is 490m and 285m for a 70kph design speed. These requirements mean that the proposed alignments have no overtaking sections. Some of the sections have been designed for a design speed of 70kph to match the design speed limit of the existing surrounding network. The one-step below the desirable minimum stopping sight distance has been provided throughout the alignments. The alignments will require a significant amount of warning lining and possibly the use of hatching to discourage speeding.

TD9/93 recommends that in sections of none overtaking the k value on vertical crest curves should be one step below the desirable minimum value. This is to ensure that none overtaking section's forward visibility is restricted to clearly dissuade overtaking in these areas (TD9/93 para. 7.30). This requirement however conflicts with another requirement, which is to provide the full stopping sight distance in the vicinity of a junction (TD9/93 para. 1.26). The alignments have been designed to provide full stopping sight distance in the vicinity of junctions, which has required the use of the desirable minimum crest curves within none overtaking sections. This is particularly the case for the alignments close to the proposed roundabout on the A52 and junction on the A515.

It is currently envisaged that the proposed alignment cross section will comply with TD27/05 requirements for a rural single carriageway all-purpose road (S2). The typical cross sections for the routes are shown in drawing D130439/CS.

The selection of junction type has been guide by Figure2/2 in TD42/95, which is shown below. This gives recommended junction types based on the predicted major road and minor road traffic flows.

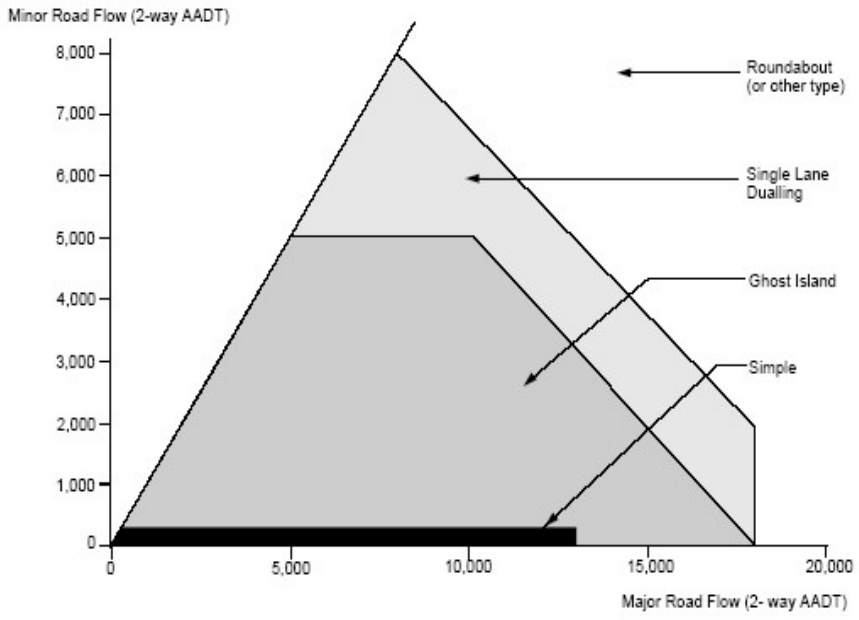

Figure 2/2 : Approximate Level of Provision of T-junctions on New Single Carriageway Roads for Various Major and Minor Road Design Year Traffic Flows (paras 2.2, 2.14)

Figure 2/2 from TD42/95

Using this graph the predicted main line traffic flows effectively preclude the use of any junction other than a roundabout (or other type). This however would appear to be an excessive requirement for very minor junctions, such as the junction with Mapleton Road. It is therefore proposed that the junctions onto the mainline are ghost island junctions.

The main junctions at A52 Mayfield road in the beginning of the bypass route is envisaged to be roundabout, whereas at the end of the route at A515 a ties into the existing alignment , with a junction provided for the old alignment onto the new road. The proposed roundabout and junction have not been designed yet as this is out of scope for this study.

5 Drainage

5.1 General Background

The proposed alignments have been reviewed to identify possible means of discharging surface water run off from the proposed carriageway. No consultation has been carried out with the Environment Agency, Drainage Board or Water Company to see if they would agree to the proposed methods of outfall.

The drainage design shall be considered for a 1 in 100 year storm return period with a 20% uplift on volumes for global warming in line with current recommendations.

The ground water from the surrounding area will tend to move towards the more permeable sub base and fill material beneath the carriageway construction. In order to contain this it is anticipated that some form of filter or basal layer drainage system will be required beneath the highway construction to reduce the moisture content of the highways construction.

In addition the area forms part of the flood plain for the River Dove. Any works that decrease the flood storage volume available may require mitigation measures to provide additional storage to replace that lost. It is therefore preferable for any works to be restricted to existing ground level. If mitigation measures are required they are likely to be in the form of ponds or wetland areas.

In the absence of existing surface water sewers in the area it would seem that surface water drainage will have to be via existing streams and drainage ditches. In the absence of drainage studies for the area these must be assumed to be running at capacity downstream during peak discharges at present, and some form of retention reservoirs may be required to moderate peak flows.

Consultation should be undertaken with the local land drainage authority for the area to ensure that existing drainage paths are not affected by the proposals. The authority is believed to be Ashbourne District Council.

5.2 Route 1

It is currently envisaged that the system would drain from the proposed roundabout at chainage 00 towards chainage 700. Storage facilities would have to be provided to attenuate the rate of outfall to the stream around chainage 700. A pollution control device will also be required to achieve the minimum legal requirements for the quality of discharging surface water, as set out by the Environment Agency. The system could then outfall into the adjacent stream at this location.

From chainage 1050 the system will also drain back to a low point at approximately chainage 700. The system could then outfall into the stream at this location. Storage will need to be provided to attenuate the rate of outfall to the equivalent of a green field site. It is currently envisaged that a detention/balancing pond could be constructed in the land between the

proposed alignment and the stream. A pipe culvert will be provided at chainage 700 to discharge drainage system to the stream.

The system will drain from chainage 1050 to the proposed detention pond at around chainage 1350; likewise, the surface water will drain back from chainage 1500 to the same location and outfall in to the stream together with a pipe culvert.

Two more outfalls have been proposed at chainages 1950 and 2650 to discharge surface water drainage system into the nearby stream. The system will drain back from chainage 2300 and 2750 to the proposed outfall point at chainage 2650. Another outfall point will collect surface drainage from chainage 1700 to 2300 and discharge it into the existing stream. This ditch is likely to require some offsite upgrading works to accommodate the additional flows.

It is anticipated that around each outfall location some storage facilities would be required to attenuate the proposed flows, to the equivalent of a green field site. Pollution control measures would also be required.

5.3 Route 2

As mentioned in section 3.3 above, Route 2 follows the same alignment as Route 1 from chainage 00 to 1200. This means that the drainage system will remain same as described for Route 1 up to this chainage.

The drainage system for the proposed route will be achieved through a combination of both outfalls into existing watercourses and into existing highway drainage system. It is anticipated that flow attenuation measures will be required including the use of balancing ponds at each outfall location, online storage ditches and oil interceptors at suitable location along the route.

Drainage system from chainages 1200 and 1450 would run to the proposed outfall point at chainage 1300, from chainage 1450 and 1650 the system would drain back to the existing Mapleton Road drainage system if one exists of suitable capacity.

From chainage 1650 onwards and the system will run to the proposed outfall point at chainage 2000, where the system from chainage 2100 will also collected at this point and drain down into the existing watercourse.

5.4 Route 3

Again, it is clear from the route description under section 3.4 that the Route 3 follows the Route 1 and 2 from chainage 00 to 650. Hence, it is assumed that the surface drainage system will also have same provision within this section as for Route 1 and 2.

After chainage 650, the vertical alignment of this route rises steadily. It climbs at a gradient of approximately 9% up to chainage 1050. Therefore, a careful consideration should be given to select the drainage section and its parameters for this section of the route. From chainage 900 drainage, system would run to the proposed outfall location at chainage 600.

Likewise from chainage 1050 to chainage 900 the system would drain back into the other proposed outfall point detailed previously.

As the alignment runs through a ridge after chainage 1050, it is anticipated that a shallow drainage system will drain to the existing highway drainage system at chainage1700, Mapleton Road crossing. This would probably flow into the existing stream via the existing highway drainage network. It is likely that these highway drains would require some improvement and the provision of online storage to control the peak flow.

From chainage 1700 onwards, drainage system runs into the proposed outfall location at chainage2000. The system will also drain back from chainage 2150 to this location.

5.5 Route 4

The drainage system for the proposed route will be a combination of both outfalls into existing watercourses detailed above and into existing highway drainage systems if sufficient capacity exists. This alignment starts at A52 Mayfield Road, on A52. Given the nature of the topography of the proposed alignment the drainage system from chainage 450 drains back into existing highway drainage network around chainage 00 on the A52. Due to the lack of a suitably close watercourse, this part of the route would be required to outfall into the existing highway drainage. An outfall is planned at chainage 800 that collects surface drainage from chainage 1150 to 450 and finally discharge into the existing stream.

The surface drainage system from chainage1150 would drain via the existing highway drains into the Mapleton Road drainage. Again, due to lack of a suitably close watercourse, the last section of this route from chainage 1900 would also require to drain back into the existing Mapleton Road drainage. In order to accommodate these additional flows, it is anticipated that the existing drainage system would require upgrading.

5.6 Route 5

Given the close proximity of this route to the Route1 and with the similar topographical nature, the drainage system for this route will have similar arrangement as for the Route1. For details, refer to 5.5 Route1.

6 Existing Conditions

6.1 Site Topography

All proposed routes start at the A52 Mayfield Road (chainage zero) and run across agricultural fields with different gradients to meet the A515 at Buxton Road just north of its junction with Windmill Lane.

Without a topographical survey, it will be impossible to provide an accurate earthworks design or quantities for the works. We shall provide a best estimate of the factors affecting the vertical alignment based upon the contour levels available and upon visual survey. This will provide an estimate of cutting and embankment areas (also see 3.3 below).

Parallel to the west of the proposed bypass an extensive stream course exists that appears to form a large part of the local land drainage system. The stream discharges to the River Dove to the southwest of the proposed routes. Alteration of this stream would be costly and may affect the hydrology of the area. As a result it is recommended that no alteration is undertaken and the bypass is aligned as far as possible from this stream course.

The site along the proposed bypass route is predominantly at grade with a terraced gentle slope facing southwest towards the stream. As all routes approach the A515 Buxton Road they have to cross either a major disused railway embankment or an abandoned tunnel which form the Tissington Trail (part of the national cycle route network) and Mapleton Road.

6.2 Geotechnical Issue

From the visual ground investigations carried out and desk studies of the area under consideration, it appears that the ground conditions are predominantly Sandstone deposition in nature. However, in areas adjacent to the drainage ditches the drawdown of the ground water table caused by the ditch will result in a marked reduction of moisture content.

In addition, given the alluvial nature of the surrounding area, it can be assumed that soil conditions could vary throughout the length of the route, with the possibility of localised areas or ‘lenses’ of varying material. These lenses may be sands, gravels or clays.

In view of this it can be assumed that the bearing capacity of the in the area will be poor in the base of the valley, with varying soil strengths anticipated to be encountered within the alluvial areas.

Preliminary design will therefore take the worst possible case for the soil bearing capacity, and provide additional surface water drainage paths in an effort to reduce the moisture content of the soil beneath the highway construction.

It is recommended that a more detailed geotechnical survey to determine the exact nature of the ground conditions is undertaken when the final alignment is agreed.

6.3 Flora and Fauna

A separate environmental assessment of the area would be essential as the route crosses areas designated as nature reserves. However, from visual survey on the 2nd March 2010 it was noted that the proposed routes would result in the removal of a number of mature species of trees and hedges that currently form part of the field boundary system outside these areas.

Should these trees, hedges (or other forms of flora or fauna) endanger the development route it may be possible to minimise the risk by using Route 3, running parallel to existing field boundaries and minimising the number of tress affected. This could also result in the remaining trees forming a visual barrier for the route from the village of Hatton.

In addition, the area contains wet areas and ponds. It is likely that these areas may contain amphibians, and it is therefore recommended that any investigation pay attention to this possibility, and that the final design seeks to minimise disturbance to any pond or wet area. Should the removal of such an area be needed it is likely that the Environment Agency shall seek a replacement area as part of the works

6.4 Existing Buildings

From the visual survey there are some buildings and farmhouse affected by the proposed routes. Alteration to the existing buildings within the routes boundaries has been considered, but the full extent of any alterations not investigated due to limitations on site access.

Route 3 shall require demolition of part of the back store and back garden facilities adjacent to the Mapleton Road crossing.

Like wise Route 3 shall require acquisition of existing Tissington Trail car park facilities at chainage 1650, just north of the Mapleton Road.

6.5 Existing Services

A search for statutory undertakers services has not been undertaken in this study. However, it is recommended that detailed information be made once the potential route is finalised.

6.6 Historic Monuments

All routes will cross areas designated as ‘Of Historic Significance’ and works will result in the disturbance of those areas. Of all routes it is considered that Route 1 will cause the minimum disturbance as it may be possible to construct the road at grade or on a small embankment to minimise the removal or disturbance of artefacts.

7 Proposed Design

The final road alignment has yet to be confirmed by Derbyshire County Council, therefore, for the purposes of this report an approximate alignment is to be designed, with assumed chainages commencing in the south at A52. It is assumed from the general site topography that the route will be approximately at grade with low embankment and no significant structures, or cuttings

The information currently available or referred to for the preparation of the preliminary design and accompanying report is listed in Appendix A – Background Information. Where definitive information is not available any design is to be based upon best practice using nationally recognised standards, but assuming the probable worst case scenario

7.1 Proposed Widths

The proposed carriageway width has been specified by Derbyshire County Council as 7.30 metres wide. A 2.40 metre wide footway/cycleway is also provided, which with 1 metre wide verges would result in a minimum width of . As a result, the proposed width of the route will be in the order of 11.7 metres wide without drainage facilities. With drainage facilities such as road side ditches a width of approximately 17.7 metres is envisaged.

Should some form of landscape mitigation be required to shield the new bypass road from surrounding areas any additional width required will have to be specified as part of a landscape mitigation package.

7.2 Pavement Design Subgrade and Capping

Pavement design should be carried out in accordance with Highways Agency requirements as given in DMRB HD26/06 (Ref 6). Given the anticipated variation of ground conditions across the site it may be assumed that the thickness of capping layer and sub grade required will vary and will be dependant upon the type ground encountered and methods of ground treatment adopted.

It can be assumed that, in order to facilitate the movement of ground water beneath the carriageway construction in flood events, that some form of basal layer will be installed (see 3.8 below). This is normally created by sandwiching a layer of free drainage material between two geotextile membranes. This basal layer may also form part of the ground improvement work required for poor soil conditions and result in a reduction of the thickness of sub-grade and capping layers.

7.2.1 Subgrade and Capping

In the absence of a geotechnical report or investigation and the possibility of varying soil conditions alligned with high moisture content the worst case scenario has been considered and a CBR of less that 2% assumed.

According to DMRB vol7, section.2, HD 25/94 figure 3.1, for the pavement foundation with less than 2% CBR, a subbase thickness of 150mm on top of 600mm capping has been adopted. The

capping layer is assumed to comprisse of free draining material which will also form the basal drainage layer.

7.2.2 Flexible pavement

According to DMRB vol.7 section 2 HD 26/06, figure 2.1,for the class 2 foundation with stiffness > 100MPa the combined design thickness of the flexible pavement will be 200mm.(See Appendix C).

As per HD 36/06, the permitted options are considered as follow.

40mm Thin wearing course surfacing system

60 mm Dense Bituminouis Macadam (DBM) 50 binder cousre

100mm Dense Bituminous Macadam DBM 50 base course

Maximum AAV for aggregate for TWCS - 16

Minimum PSV required for TWCS - 55

7.3 Earthworks

It is important to note that, due to the topography of the area, the earthworks balance of each bypass route is poor.

Currently the proposed route is assumed to have no major structures or strengthened earthworks required along the route apart from the works on Route , although structures are likely to be required at the stream crossing points. Consideration should be given to the foundation design of these structures considering the local ground conditions following confirmation of the road alignment.

The structures are most likely to be precast concrete box culverts whose design will enable their dead load and the applied load from the road construction to be spread over their base area, reducing the ground pressure loading on the made up ground.

The soil strength results in the alluvial soil are expected to be quite low and include local variations in soil conditions crating soft spots. Without treatment, improvement or removal the soft spot areas are unlikely to provide a suitable foundation for the proposed road, due to its low strength and variable nature.

This would normally also require the increase in depth of capping and sub-base layers to compensate for the low ground strength by distributing the load over a greater area.

A ‘standard’ road pavement construction is therefore likely to result in an undulating road surface over time as the road subsides over the weaker areas and the stronger layers remain unchanged. This is likely to result in serviceability and maintenance problems to the road and drainage as cracks, low spots and steps form.

Cuttings or embankments should be formed at a shallow angle; an assumed slope of 1:2 has been taken for design purposes. This may require some form of retention or slope stabilisation in

the initial stages before root growth from landscape planting can establish to help to stabilise any new slopes.

7.4 Safety Fencing / Boundary Fencing

As the route will form part of the Derbyshire County Council highways networks there is no requirement under TD 19/06 'Requirement for Road Restraint Systems' for the provision of safety fencing along the route.

However, given the possibility of heavy vehicles reaching high speeds along the route and the presence of adjacent water features such as drainage ditches, it is recommended that the final design consider the requirements of the Technical Directive for the protection of such features.

Where features such as box culvert bridges, large culverts or water features have been identified as a possibility from the preliminary design costs for safety fencing have been included in the estimate of costs.

Agricultural boundary fencing shall be required along the route, the exact nature depending upon accommodation works agreements. In addition it is likely that hedge planting shall be required by the landowners. It is advised that the ownership of the fence and hedge line is transferred back to the land owners at the expiration of the normal construction maintenance period. Additional land take will be required to accommodate any hedge planting required, although this area f land would be transferred back to the original landowner with the hedge line maintenance responsibility.

7.5 Anticipated Construction Costs

7.5.1 Highways Construction

Highway construction costs are based upon the construction of a 7.30 metre wide carriageway and associated footway/cycleway at existing ground level. Given the area is alluvial up ground it can also be assumed that the ground bearing strength may be poor in general and that additional costs for ground improvement shall be required.

An exercise has been carried out to cost roadworks per 100 meters at today's prices (March 2010) using rates obtained from the Highways Agency Framework 2 Contract. The approximate cost has been found to be in the order of £150,000 per 100m length purely for carriageway construction.

Comparable costs from the A6192 Markham Lane (let in 2004) are £1,100 per meter, for a 7.3m wide carriageway without footway or cycleway, or remediation works for soil conditions. Given inflation at today's rates and the additional metre strips width, this would equate to £1,600 per metre for the highway construction when taken in isolation.

Additional side road or junction alteration construction costs may increase the rate locally up to £3,500 per metre. This would typically take place at the junction of the A515 Buxton Road and new roundabout on the A52 Mayfield Road.

Structures shall be needed at the crossing of the Tissington Trail. At present the usage of the Tissington Trail cannot be confirmed, so loading of the box culvert for Route 1 cannot be predicted. From previous works a figure of £1,000,000 has been provided for the outline design estimate, but this may vary depending upon the width of the culvert required, the depth of cover, and the loading.

It is envisaged that a box culvert or similar structure will be constructed for Route 3 and 3 at around chainage 1650. A rough estimate would be between £175,000 to £225,000 in construction costs, allowing for the use of precast concrete box culverts to serve the new carriageway, with the local re-lining of disturbed watercourses.

Given these costing an estimate of construction costs for the routes are

Route 1

2800 m length @ £1,600 per metre =	4,480,000	
Box culverts at embankment crossing	1,000,000	* (provisional figure – see previous notes)
Box culverts for stream crossing 3 no. @£200,000	600,000	
New Junction construction at A515 =	300,000.	
New roundabout construction at A52 =	500,000	
Ground mitigation works (estimated see 7.5.2 below)	158,200	
Total	**£7,038,200**	

Route 2

2145 m length @ £1,600 per metre =	3,432,000
Box culverts for stream crossing 3 no. @£200,000	600,000
New Junction construction at A515 =	300,000.
Property acquisition car park and services	400,000
New roundabout construction at A52 =	500,000
Ground mitigation works (estimated see 7.5.2 below)	121,475
Total	**£5,390,475**

Route 3

2150 m length @ £1,600 per metre =	3,440,000
Allowances for cutting steep slope 20% extra over =	1,032,000
Property acquisition no 3 @ 250,000	750,000
Box culverts for stream crossing 3 no. @£200,000	600,000
New Junction construction at A515 =	300,000.
New roundabout construction at A52 =	500,000
Ground mitigation works (estimated see 7.5.2 below)	121,480
Total	**£6,743,480**

Route 4

1915 m length @ £1,600 per metre =	3,064,000
Allowances for cutting steep slope	
30% extra over =	919,200
Property acquisition no 3 @ 250,000	750,000
Box culverts for stream crossing 3 no. @£200,000	600,000
New Junction construction at A515 =	300,000.
New roundabout construction at A52 =	500,000
Ground mitigation works (estimated see 7.5.2 below)	108,198
Total	**£6,241,398**

Route 5

1950m length @ £1,600 per metre =	3,120,000
Allowances for cutting steep slope	
30% extra over =	936,000
Property acquisition no 3 @ 250,000	750,000
Box culverts for stream crossing 3 no. @£200,000	600,000
New Junction construction at A515 =	300,000.
New roundabout construction at A52 =	500,000
Ground mitigation works (estimated see 7.5.2 below)	110,175
Total	**£6,316,175**

For comparison, figures provided in TA46/97 Traffic Flow Ranges for Use in the Assessment of New Rural Roads - Annex C Construction Costs give a construction cost range of between £1.3 and £2.3 million per km. based upon 1994 prices. Taking a base rate of inflation for construction industry of 4% at current prices this equates to a cost of between £2.25 and £3.98 million per km.

7.5.2 Geotechnical Costs

The additional costs of ground mitigation works will vary depending upon the type of work undertaken and the scale of those works at each particular location. Given the possibility of varying ground conditions within the site, and the lack of accurate data from site to identify specific ground conditions, any estimate of costs associated with geotechnical works has been taken for the worst case scenario, based upon previous experience of such sites.

It is anticipated that the entire site shall use geotextile membranes of some form, either for soil strengthening or for separation of the new construction from existing contaminated ground to prevent leachate.

Ground mitigation works are taken as the provision of a drainage / capping layer between two layers of geotextile membrane, estimated at £5/m2. This is extended 1.0 metres beyond the edge of the construction area.

It may be possible to reduce the cost of ground mitigation works following geotechnical investigations in the area, but at present the worst case scenario has been taken for costing purposes.

7.5.3 Anticipated Statutory Undertakers Costs

It may be reasonable to assume that additional costs will be incurred for the movement and/or replacement of existing services at the junctions of the route with the existing highways network. Without a preliminary design study being completed it is impossible to identify the full extent of these works or services affected by the highway alignment, but it is believed that alterations to services will be limited to adjustment of existing agricultural water and electrical supplies, overhead power supplies and British telecom ducts.

Existing pumped combined sewers can normally be sleeved or protected by suitable reinforced slabs as they are usually sited at sufficient depth in agricultural fields to avoid damage by farming operations. This should be verified by further investigation with the appropriate statutory undertaker.

It is difficult to quantify these works at present, but given the rural nature with the availability of land adjacent to the proposed alignments, it is anticipated that additional costs will be limited and could be carried out in advance of any construction works.

The works may have to be undertaken by the service supply firms themselves, and additional costs attached to the works for their specialist attendance and supervision. For that reason we believe that a sum in the region of between £300,000 to £400,000 should be put aside for these works.

7.5.4 Contaminated Land

Given the previous usage of the Tissington Trail as a railway line it is probable that the area is contaminated with residual materials. This normally takes the form of high sulphate readings from coal slag and residual heavy metals. It the estimates it has been assumed that any excavated materials will be reused on site as fill material. If materials are contaminated and have to be removed from site it is anticipated that additional cost will be incurred as these materials will have to be disposed of to specialist tips.

Prior to the final design of the accepted route it is recommended that a full investigation into soil contamination is undertaken

7.5.5 Anticipated Total Costs

Given the anticipated costs for highways construction and ground mitigation works it is believed that the total costs for the scheme (excluding land acquisition and accommodation works) shall be in the region of £7.038 million for Route 1, £5.30million for Route 2, £6.74 million for Route 3, £6.24 million for Route 1 and £6.316 million at current rates.

Following decisions on the preferred Route, it is believed that these costs may be reduced by further ground investigation works reducing the ground mitigation works, and liaison with the statutory undertakers affected by the works.

8 Conclusion

The purpose of this report is not recommend a particular route, as the assessment of a route needs to be done based on wider issues.

There are no significant geotechnical problems or drainage issues currently identified to discount any particular option.

Each of the Routes 1 to 3 that have been developed can be designed and constructed in accordance with the current standards. Routes 4 and 5 are not considered viable due to the problems with access gradients between the cemetery and water treatment works.

There are some significant risks with all the options, which cannot be fully identified or quantified at present, these are;

Public Utility Diversion Works

Unknown Geology

Soil Contamination

All routes will need to cross the Tissington Trail, disturb areas designated of historical or natural significance, and remove the current rural nature of the stream valley. However, the current road network through Ashbourne which this route will replace is below current standards, and the disruption that the provision of the bypass must be weighed against the benefit to the town of Ashbourne as a whole, and to the users of the A512 and A52.

9 Appendices

9.1 Appendix A – Background Information Referred To

- Design Manual for Roads and Bridges - Currently available at the Highways Agency web site

  http://www.standardsforhighways.co.uk/dmrb/index.htm

- Proposed Alignment Design in accordance to the TD9/93

  http://www.standardsforhighways.co.uk/dmrb/vol6/section1/td993.pdf

- Cross section of the proposed alignment Design in accordance to the TD27/93

  http://www.standardsforhighways.co.uk/dmrb/vol6/section1/td2705.pdf

- Any Roundabout Design to be in accordance to the TD16/93

  http://www.standardsforhighways.co.uk/dmrb/vol6/section2/td1607.pdf

- County Specific Requirements from Derbyshire County Council Development Control - Currently available at the Leicestershire County Council web site

  http://www.leics.gov.uk/index/highways/road_pathway_maintenance/htd.htm

9.2 Appendix B - Drawing List

D130439 / 1.1 Ashbourne Bypass – Route 1 – Alignment Sheet 1 of 2

D130439 / 1.2 Ashbourne Bypass – Route 1 – Alignment Sheet 2 of 2

D130439 / 2.1 Ashbourne Bypass – Route 2 – Alignment Sheet 1 of 2

D130439 / 2.2 Ashbourne Bypass – Route 2 – Alignment Sheet 2 of 2

D130439 / 3.1 Ashbourne Bypass – Route 3 – Alignment Sheet 1 of 2

D130439 / 3.2 Ashbourne Bypass – Route 3 – Alignment Sheet 2 of 2

D130439 / 4.1 Ashbourne Bypass – Route 4– Alignment Sheet 1 of 2

D130439 / 4.2 Ashbourne Bypass – Route 4 – Alignment Sheet 2 of 2

D130439 / 5.1 Ashbourne Bypass – Route 5 – Alignment Sheet 1 of 2

D130439 / 5.2 Ashbourne Bypass – Route 5 – Alignment Sheet 2 of 2

D130439 / CS Ashbourne Bypass – Typical Cross section

Ashbourne Bypass – Proposed Roundabout at A52

Ashbourne Bypass – Proposed Junction 1 at A515

Ashbourne Bypass – Proposed Junction 2 at A515

Ashbourne Bypass – Proposed Junction at Mapleton Road crossing